ôäì Ó ãê ã—

ñî˜´äß• òÓ ÁŽØèß• æô‘ Þ» â› ìò›•

1 4 ”àŒ³û•
1 3 ”àœãøß ê‘Ž¸ã

ž—Žèß• ÞÜ¸ß• Žã ìÆ£

2

X	4	4	4	4
Y	1	2	3	4

1

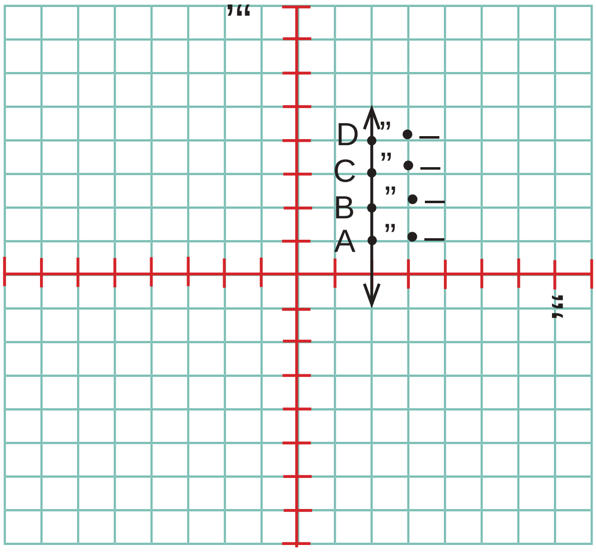
X	2	1	1	1
Y	1	2	3	4

4

X	-1	-2	-3	-4
Y	2	4	6	8

3

X	1	2	3	4
Y	-2	-2	-2	-2



5 ò›•ª£û• ñî˜´äß• òÓ ”èôÌß• ÁŽ

5 Ý•†´ß•
4 ÝŽœäàß ê‘

*¾²¶ž	A	B	C	D
X				
Y				

•Žèó Þ £ïßª—

òèô´ß• -î¤äßŽ‘ âôØ˜´äß• ”×üË Žã ìÁŽØèß• æô‘ Þ»

7

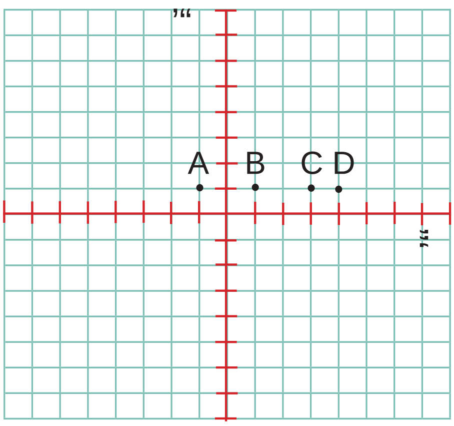
X	-1	0	1	2
Y	3	3	3	3

6

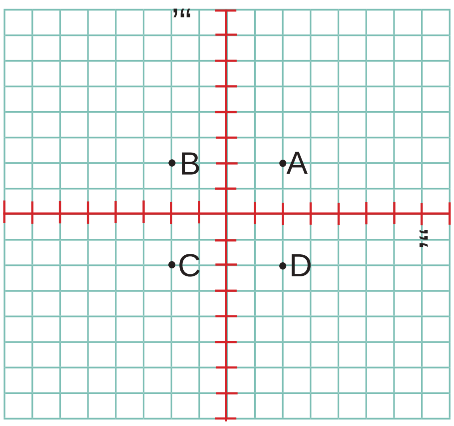
X	-5	-4	3	2
Y	2	1	0	-1

ž—Žèß• ÞÜ¸ß• Éîç æô‘í ì ò›•ª£û• ñî˜´äß•

9



8



10

	-3	-7	-11	-15

10

X	2	4	6	8
Y	3	6	9	12

15

12

.15km

13

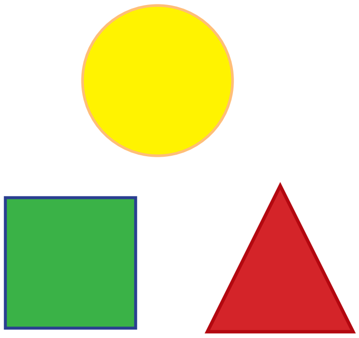
14

15

400

Ý•íªß• òÓ ëãªØã

,QWURGXFWLRQ RI)XQFWLRQV [6-2]



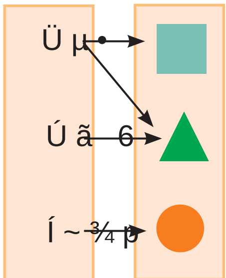
®ãŽ›í Þ‹•íí æäóƒ â³- "³¬ªäß• â³®ãªèò
Žœàœã í Ê'®ã âãŽÚƒ ƒâ³- ì"ô³ªêë
ñ®‹•© ®ãŽœàœãí Þ‹•í â³-í"ß•ªß• ‡
ò³ªèìß• ÞÜ¸ß•í •ßŽÁ ÞÛ æô
êä³- ñ¬ß•

ë - ª ß©©

"ß•ªß• Ýíª Ÿ ÝŽ
ñí¬ªäß• ëô³ªêë
ò³ªÊù•
• • © ® Ó äß•
"ß•ªß• ‡
"ß•ªß• ×üÌß•
"ß•ªß• "ªËŽ×
®¼èìß•
"-î¼ß• ‡

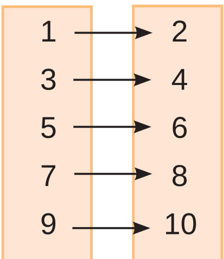
5HODWLRQ DQG)XQFWLRQ >6-2 1

"à§ª"äô× ÞÜß ÂØÓ "ª£•í "Ÿ®¨ã "ä
"Ÿ®¨äß• "äô× ðàË Ýî¼¤àß "à§ªã "äô× ¾óîÌ



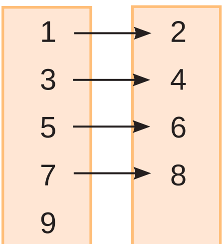
(1 Ý Žœã

ìêä³- ñ¬ß• ò³ªèìß• ÞÜ¸ß•í •ßŽÁ ÞÛ æô"×
"à§ªäß åŽŸ®¨ã êß ñƒ ì šàœã ì Ê'®ã æô
"ß•© Þœä—û "×üÌßŽ



(2 Ý Žœã

Úß÷Ó ®îû áƒ "ß•© Þœä— "×üÌß• –ç
(1,2),(3,4),(5,6),(7,8),(9,10)
-íŽ äß• ÂÄ¨äßŽ' "×
"ß•© Þœä— "×üÌß• å„Ó Úß¬ß ÂØÓ "ª



(3 Ý Žœã

Úß« ®´Óƒ î û áƒ Ÿ•® ã×
ÂØÓ "ª£•í "Ÿ®¨ã ÙŽèë "à§ªã "äô× ÞÜß –ç
. •ŽŸ®¨äß• âô× æ9 ©"äßŽ× Ó„

(4 Ý Žœã

Úß÷Ó ®îû áƒ "ß•© òàó Žäô "×üÌ Þ
"à§ªã ÞÜß ÂØÓ "ª£•í "Ÿ®¨ã ÙŽèë {(1,3),(1,5),(2,8),(1,9)} ×üÌß• å
-1 "à§ªã àß Ÿ®¨ã ÙŽèë å÷ "ß•© {(-2,6),(-1,6),(0,6),(1,6)} Ë -Ž5 ç (i ÆÊü

&RPSOHWH 7DEOH RI)XQFWLRQ

” Ÿ ® ¨ ä ß • í ” à ß ë ä ß • ¬ ä ô Ý í â ß • î ë

(5 Ý Ž œ ã

® ¼ è Ì ß • ” à § ª ä ß •	ß • ª ß •	“ - î ¼ ß ” Ÿ ® ¨ ä ß •
X	X-3	Y
-1	- 1 - 3	-4
0	0-3	-3
1	1-3	-2
2	2-3	-1

X = 1, 0 1 2 å ‡ Y « X-3 ” ß • ª ß • Ý í ª Ÿ Þ

ª è ß ” ß • ª ß â ô “ ª Ë Ž ß ¼ ó î Ì ˜ ß Ž ‘ ” ß • ª

- í Ž ä ß • Ý í ª ß • ò Ó Ý £ û ó Ž ä

ò › • ª £ û • ï î ˜ ´ ä ß • ò Ó Á Ž Ø è ß 3@

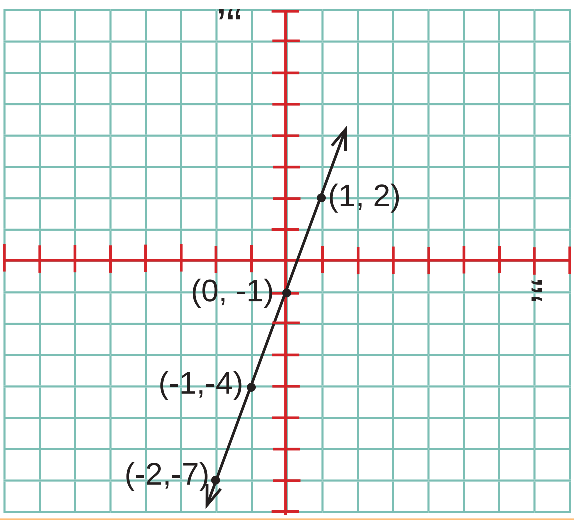
5HSUHVHQWLQJ WKH)XQFWLRQ RI 1XPEHU

(6 ´ ä ß Ž œ ã

X -1, -2,0 1 å ‡ Y « 3X-1 ” ß • ª ß • ò › • ª £ ÷ • ï î

ò › • ª £ ÷ • ñ î ˜ ´ ä ß • ò Ó “ î Á Ž Ø è ß • é Ž ç © • Ý í Ä ¨ ß •

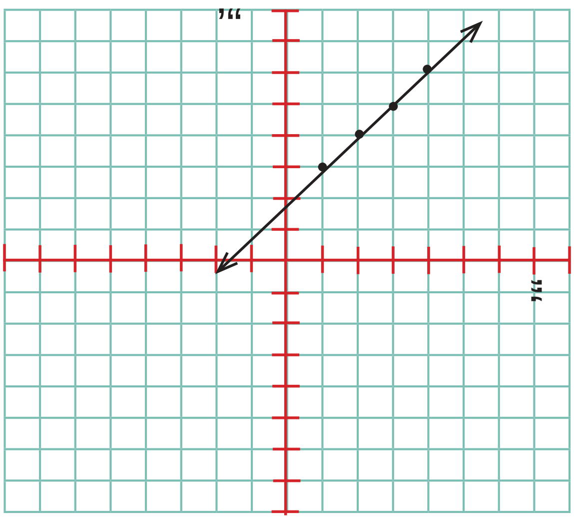
é Ž ç © • Þ Ü ¸ ß • ò Ó æ ô ’ ã Ž ä Û â ô Ø ˜ ´ ã ð à Ë Þ “ ¼ Ä ¨ ß •



® ¼ è Ì ß • ” à § ª ä ß •	” ß • ª ß •	“ - î ¼ ß • Ÿ ® Ž ¨ ä ß •	• í ° ß • — ® ä ß •
X	3X-1	Y	(X,Y)
-1	3(-1)-1	-4	(-1,-4)
-2	3(-2)-1	-7	(-2,-7)
0	3(0)-1	-1	(0, -1)
1	3(1)-1	2	(1, 2)

(7 Ý Ž œ ã

ò › • ª £ ÷ • ñ î ˜ ´ ä ß • ò Ó ê á œ á • í Ý í

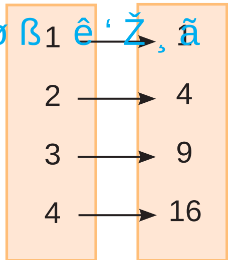


® ¼ è Ì ß • ” à § ª ä ß •	” ß • ª ß •	“ - î ¼ ß • Ÿ ® Ž ¨ ä ß •	• í ° ß • — ® ä ß •
X	X+2	Y	(X,Y)
1	(1)+ 2	3	(1,3)
2	(2)+ 2	4	(2,4)
3	(3)+ 2	5	(3,5)
4	(4)+ 2	6	(4, 6)

Óà§ì Ó ãÙ¸ ã—

.•'´ ß®Û•« îû áƒ "ß•© "×üÌß• Žäà

1 3 "àŒ³û•
1 3 "àœãøß ê'Ž¸ã



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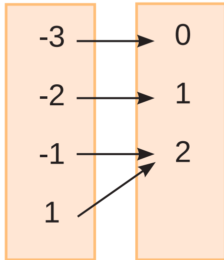

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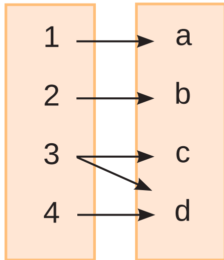


1

^√6 √7 √5 √3` òë •ŽŸ®¨äß3 5Ëöì,ä ãíòë •ü§ªäß• "Ëîä ã
•'´ß• ®Û« Êã îû áƒ "ß•© "ôßŽ˜

4 ^ 3, √3 √5 √6 √7`

5 ^ 3, √3 √7 √3 (6, √6 √6`

4 5 "àŒ³û•
4 ÝŽœäàß ê'Ž¸

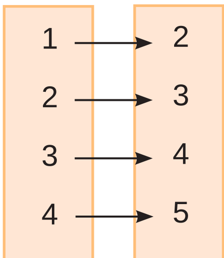
®¼èÌß• "à§ªäß•ªß•		"-î¼ß• "àËŽ¨äß•	ß•—®äß•
X		Y	(X,Y)
1		600	(1,600)
2			
3			
4			

6 •í°ß•©ªË âÛ ì"Ë600ßŽÔ"ß Þ Û„ó
ìËŽ34 òÓ µŽÔ¨ß• ŽìàÛ•
•ŽËŽ´ß• ©ªË æô' "×üÌß• æ
Ýíª ß• Þœã â› ìµŽÔ¨ß• ŽìàÛ
ò›•ª£û• ïî˜´äß•

6 Ý•†´ß•
ì æôßŽœäàß ê

•Žèó®ŽãŽ§ß•«ƒ

.•'´ ß®Û•« îû áƒ "ß•© "×üÌß• Žäà



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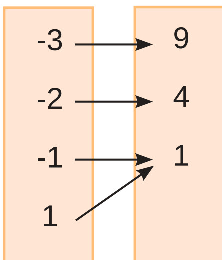

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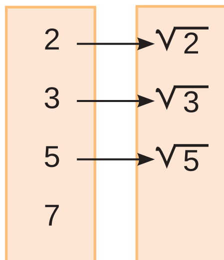


7

^√6 √7 √5 √3` òë •ŽŸ®¨äß3 5Ëöì,ä ãíòë •ü§ªäß• "Ëîä ã
•'´ß• ®Û« Êã îû áƒ "ß•© "ôßŽ˜

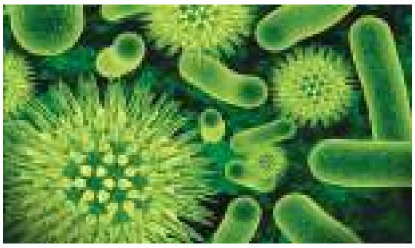
10 ^ ,3 √3 ,5 √5 ,6 √6`

11 ^ 3 √3 √7 5 √6 7 √5`

®äìß• X	10	20	30	40
"Ûàì˜´äß• Y	15	25	35	45

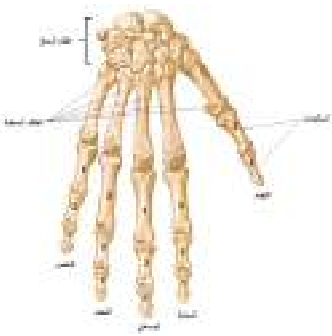
12 ò—õ• Ýíª ß• æã

13



14

15



16

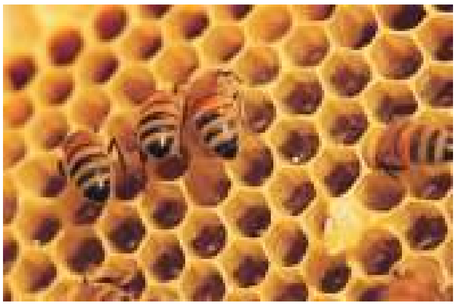
17 $\{41, 49, 57\}$

18

$Y = X + 7$

$Y = X - 7$

19



Þ´Ìß• •Ž˜çù Þ¤èã ªôÌ³ îªß åŽÛ
îà24Û”Ë®´‘ ®ôÄ— ”à¤èß• åƒ Æ£ûíß•
æô‘ Â‘®— ò˜ß• ”×ùÌßŽã ”ËŽ´ß• ©
ò˜ß• ”ÓŽ´äß•í •ŽËŽ´ß• ©ªË
î••®˜ãîàôÜßŽ‘ Žì‡ÄØ—

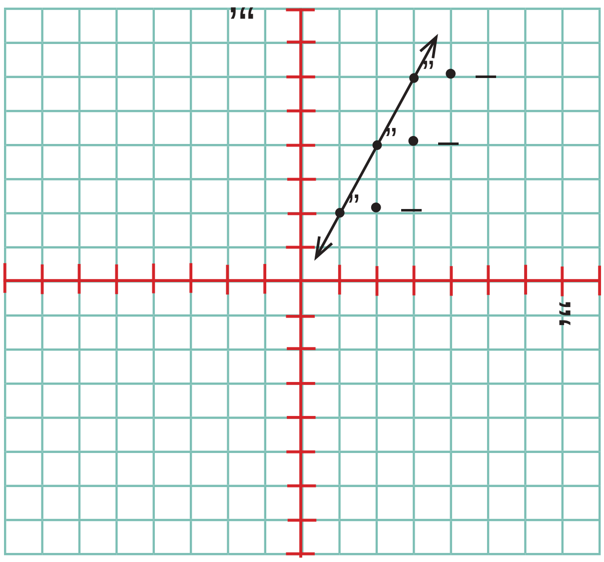
ò›•ª£ù• ïî˜´äß• òÓ âôØ˜´äß• 6-3
5HSUHVHQWLQJ /LQHDU)XQFWLRQ RQ 6WUDLJKW /LQH

•¬ë ðä´ó ñ©îäË ®ôÏ ª£•í âôØ˜´ã ðàËÄŽìèã ”ß˜èª
”ôÄ¨ß• ”ß•ªß• åŽô‘ âôØ˜
”˜‘Ž›m©í•tª£ôƒ y = mx+t “-î¼ßŽ‘ ”ôÄ¨ß•Ì—”ß•ªß• âìäŽôÓ®ªß• ”ß

î•ŽËŽ´ßŽ‘ æã°ß• ðàË®˜ãîàôÜß 1Ž‘ ”à•ßã

®¼èÌß• ”à§ªäß•	”ß•ªß• “ªËŽ×äß•	“-î¼ß• •í°ß•	•—®äß•
X	Y=24X	Y	(X,Y)
1	24(1)	24	(1,24)
2	24(2)	48	(2,48)
3	24(3)	72	(3,72)

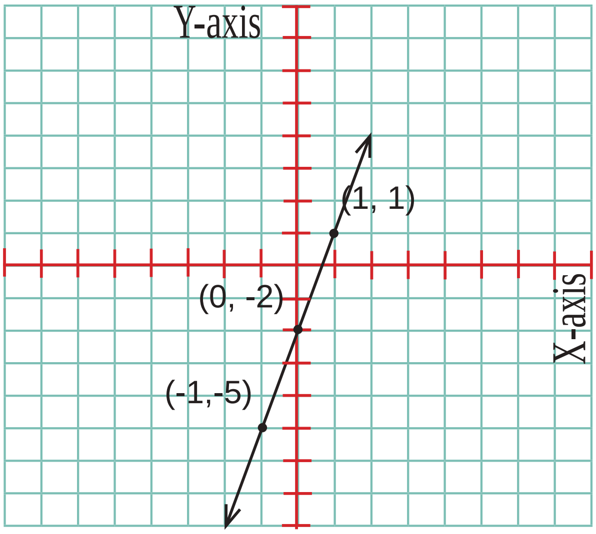
”ß•ªß• ðŽ¸íç‡ “îÄ¨ß•
”à¤èß• å•®ô®ÔçŽËŽ
Y ”ËîÄØäß• XÓŽ®¼èÌßŽ‘
Y= 24X ”ß•ªßŽ‘ Þœ
”ß•© ÝíªŸôŠŽçƒß• “îÄ



ò›•ª£û• ïî˜´äß• òÓ”ßŽ•ªß• Þî
Ê×îãàÌçæåƒ òÔÜó ”ôçŽô‘ ”ôÄ
”ß•ªßŽôçŽã‘ æô˜Ä
æô˜ËŽ³ ”à¤èß• ®ôÄ— Žãªè
•ŽËŽ³®ôÄ—48Žãªè”ËîÄØäß• ”ÓŽ´äß
.72 ”ËîÄØäß• ”ÓŽ´äß•
Žäôã ØÄ§Ž Þœä— ” —Žè

ò › • ª £ ÷ • ï î Ÿ´ y = 3x-2 ð Ó Ä ¨ ß • " ß (2ª ß Ý Ž Þ œ ã

ò › • ª £ û • ï î ˜ ´ ä ß • ð Ô ç Ž ß œ ß ß • " î Ä œ ß ã ƒ   " ô Ä § ß î ß • © î Ä í ß

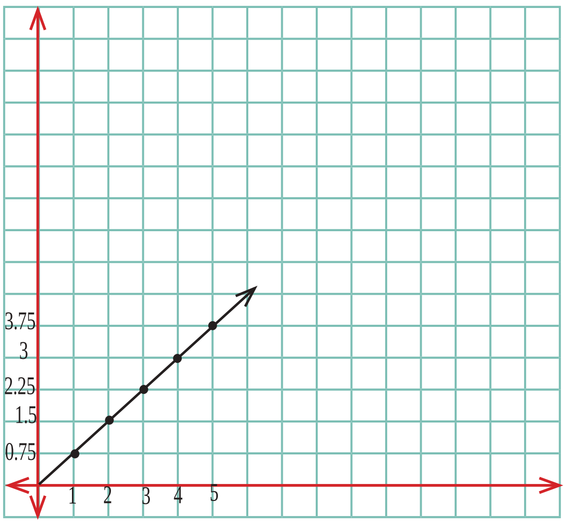


® ¼ è Ì ß • " à § ª ä ß •	" ß • ª ß •	" ª Ý Ž ® × ä ß •	" - î ¼ ß • • í ° ß • • — ® ä ß •
X	y = 3x-2	Y	(X,Y)
-1	y = 3(-1)-2	-5	(-1,-5)
0	y = 3(0)-2	-2	(0, -2)
1	y = 3(1)-2	1	(1, 1)

ò ç Ž ô ' ß • Â Ä ¨ ä ß • æ ã â ô Ø ˜ ´ ä ß • [6-3-2]
Written Linear Function (Equation of Straight Line) from the Graphs

" ô ‹ Ž À Ô ß • Ž ³ Ž ç " ß Ž Û 2011 ó ® Ž ä ß (3 à ô Ž œ ã '
" Ë ® ´ ' í ¦ ó ® ä ß • ¢ Ä ³ ð à Ë " - Ž ô ³ â ¤ ' Ý î ˜
ò ˜ ß • " Ó Ž ´ ä ß • æ ô ' — " ß • © ¢ ¿ î 0.75m ç Ž ô ' ß
• ˜ Û • â › " ô Ä § " ß • © Ý í ª Ÿ „ ¸ ç ƒ ì Õ ® Ð ˜ ´ ä
Ž ì à œ ä — ò ˜ ß • " ô

Ý í ª Ÿ å y î Ü ð ˜ ó " Ó Ž ð ä ß œ ã ° ß • å ƒ ½ ® Ô ç š ô £ " ß • © Ý í ª Ÿ ï Ž ¸ ç
" ô Ä ¨ ß • " ß



® ¼ è Ì ß • " à § ª ä ß •	" - î ¼ ß • Ý ® ¨ ä ß •
X	Y
1	0.75
2	1.50
3	2.25
4	3.00

ò ë " ß • ª ß • å ƒ ž ˜ è ˜ ´ ç - í Ž ä ß

y = 0.75x

Ûäì Ó ãêã—

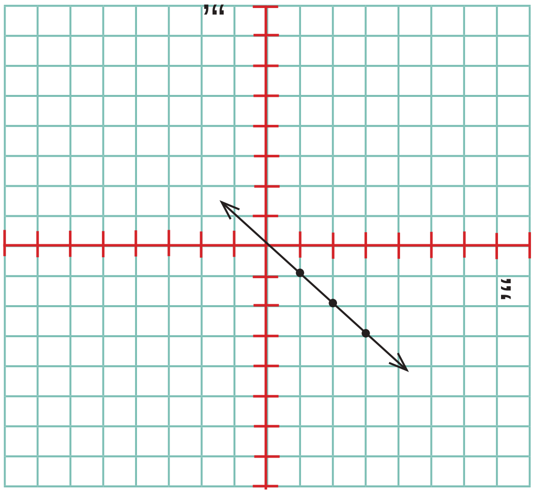
1 5 "àŒ³û• ò›•ª£û• ñî˜´äß• òÓ "ôßŽ˜ß• ... Y•íªß

1 2 æôßŽœäàß ê'Ž¸ã

1 Y=X **2** Y=X-9 **3** Y=X+2 **4** $Y=\frac{3}{2}X$ **5** Y=12-X

6 7 "àŒ³÷• "ôÄ¨ß• "ß•ªß• "'Ž˜Ûí "ß•ªß• ÝíªŸ ïŽ¸ç

3 ÝŽœäàß ê'Ž¸ã



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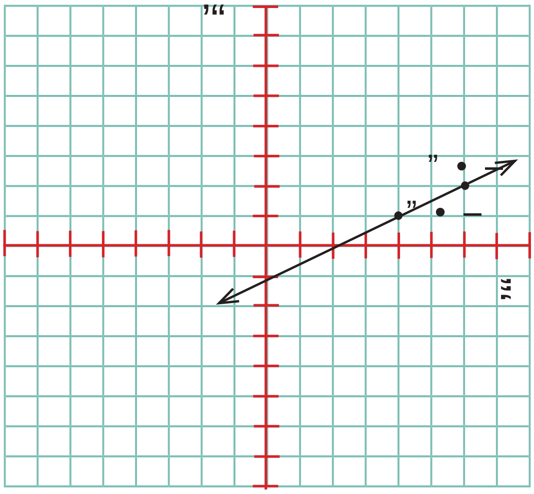


7

ò›•ª£÷• ñî˜´äßŽ' "ôßŽ˜ß• "ô

8

X	-2	-1	0	1	2
Y	-1	0	1	2	3

X	2	1	3	4
Y	4	3	5	6

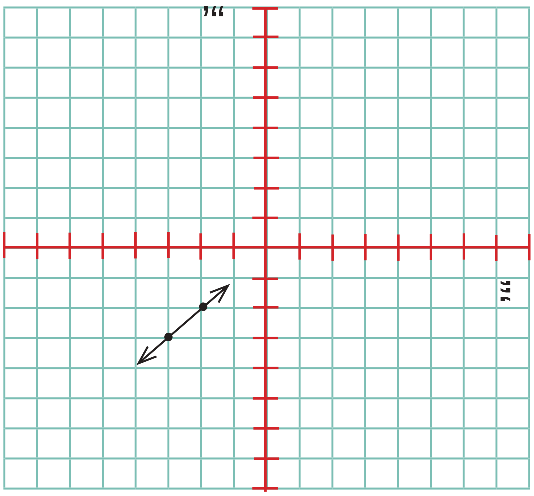
9

•Žèóßâ¸ãß•

ò›•ª£û• ñî˜´äß• òÓ "ôßŽ˜ß• òÄ ß• Y•íªß•

10 Y=7X **11** Y=3X-4 **12** Y=X+4 **13** Y=9X-0.5 **14** $Y=\frac{X}{2}$

"ôÄ¨ß• "ß•ªß• "'Ž˜Ûí "ß•ªß• ÝíªŸ ïŽ¸ç



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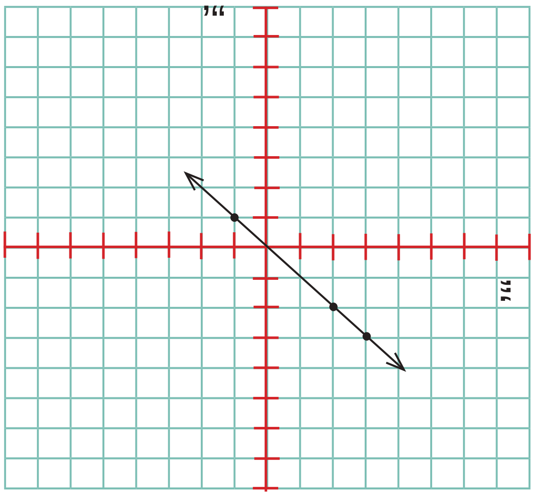


16

ò›•ª£÷• ñî˜´äßŽ' "ôßŽ˜ß• "ô

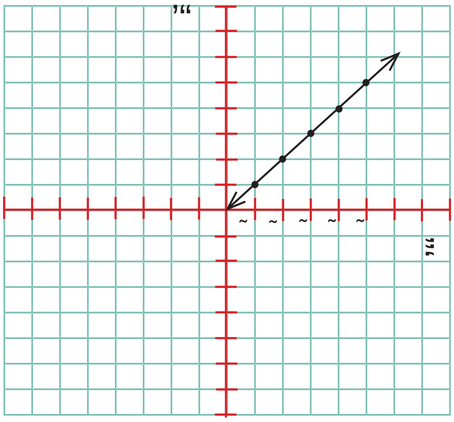
17

X	-2	-1	0	1	2
Y	2	1	0	-1	-2

18

X	2	1	3	4
Y	5	3	7	9

ñô —ßŽ‹ØŽÐ ã ø ª —



19 "ô‹Ž¼£‡ ñ® ó åƒ åî'Ž¼ß•ïŽË¼ß "

ðß• ¡Ž'-û• — 5»Ýüß‡ "ëôèß• Žìôàë —à

"ß©Žìäß• •˜Ûƒ â› òçŽô'ß• ÂÄ¨äß•

••îè´ß• ©ªË ðß• "'´èßŽ' ¡Ž

20 "à´ß• "®Û "'ìß "óŽìç òÓ: ÁŽŽ ß• æ

5ð' Þ×ƒ "Ø'Ž´ß• "'ìàß• òÓ ï®¸' Žì˜à

"ôßŽ¤ß• "'ìàß

ò›•ª£û• ñî˜´äß• òÓ "ôÄ¨ß• "ß•ªß• Þ

"ß•ªàß "ãŽìß• "ôÄ¨ß•

21 4 áŽ¸ë Êã åŽÛ •12ˆ ð' "ŽŽô©©å ßã

"ß•© Ž˜ôÛè³ -Žèó©ô âîôßã"Ä§ êóªßí

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"ß•© Ýíªÿ ªóª¤— ªì' "-Žô´ß• ï•®¸ß ò

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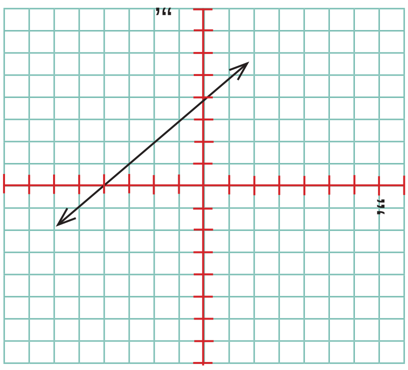

22 "ôÄ¨ß• "ß•ªß• ÖØ¤— ò›•ª£ û• ñî˜´

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23 •®Àßê•èªì'¡®Áôô®¿ òìô'Á:Ã©ªË 5

.70 ©ªËŽáó ßŽ´ã òàÜß• ž—

îòìô'Äß• ©ªìàß "'´èßŽ' òàÜß• ž—

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y 5x 3 âôØ˜´ã "ß©Žìã "ãŽìß• "ôÄ¨ß• "ß•

ò›•ª£û• ïî˜´äß• òÓ å•
5HIOHFWLRQ DQG 5RWDWLRQ LQ WKH & [6-4]

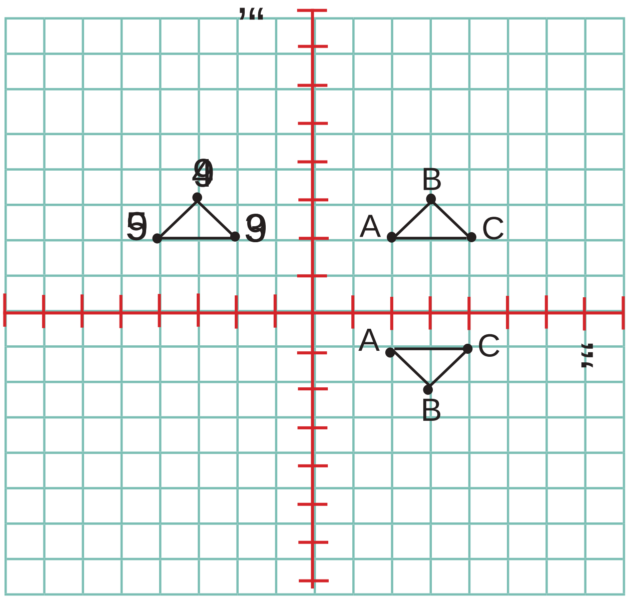
ê—-î» ²ÜÌè— ®‹ŽÁ ÞÜ ¸“ ïî˜´äß• òÓ ®¸ŽÁ
òÓ ÁŽØç ™ü› ®¤³ •©ª£ •«ˆÓ
ÁŽØè ABC ª®èŽÄàß ”ôà»÷ò³ª-ê¼ß•ÞóŽ¤˜ß
.C,B,A ô ïŽäß• òÓ Žì’ô—®±ŽÜÌçû• Âß

±ŽÜÌçû• Þôœ
ïî˜´äß• òÓ å•-íªË
ò›•ª£û• ïî˜´äß•
•©®Ôäß•
±ŽÜÌçû• ‡
å•-íªß• ‡
ò›•ª£û• ïî˜´äß•

ò›•ª£û• ïî˜´äß• ›òÓ1
5HÀHFWLRQ LQ WKH &RRUGLQDWH 3ODQH

òÓ ”ÄØç ÞÛ Ýî¤ó ñ¬ß• ”ô³ªèìß• ÝŽÜ·û• òóª-ŽìÌß• ±óîó
ê´Ôç ñî˜´äß• òÓ ï®§ƒ ”ÄØç
. ÞÜ¸ß• ”ôè‘ ðàË ±ŽÜÌç÷• ÆÓŽ¾ ÞÜ· ä³âÜàªß• Þóî¤®ã
òØÓƒ íƒ ñ©âŽËÂ§ •îëÂ

®¤³ Žì—A,B,C ÁŽØèß• ±ŽÜÌç Ýªâã
åîÜ˜ÓA,B,C ÁŽØèß• Þœä— ò˜ß• ”’—®äß•



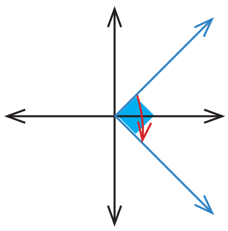
A(2,2) , B(3,3) , C(4,2)
æÜôßí ±ŽÜÌçû• Â§ ©ª¤ç
±•- ÞÛ æô‘ ••ª£îX-axis ©ªË
±ŽÜÌçû• Â§í
”ì ß• òÓ ±•- ÞÜß ŽœßŽœ•“
¢’¼ôÓ ê´Ôç ªì’ßŽ‘ ±ŽÜÌçû
”ãŽË “Aî(2,-2) B (3,-3) C (4,-2)
-î¤ã ±ŽÜÌçû• Â§ åîÜó Žãªè
îë •Žèô´ß•

$R_x [(x,y)] = (x,-y)$

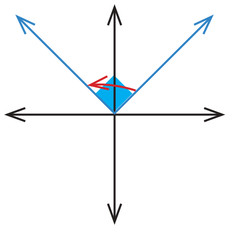
. < D[LV-î¤ã ðàË A(2,2) , B(3,3) , C(4,2) ÁŽØèß•(±ŽÜÌç•
. A 9(-2,2), B 9(-3,3), C 9(-4,2) ðàË ±ŽÜÌç÷• ªì‘ Â
îë ••©Ž¼ß• -î¤ã ±ŽÜÌçû• Â§ åîÜó Žãªè

$R_y [(x,y)] = (-x,y)$

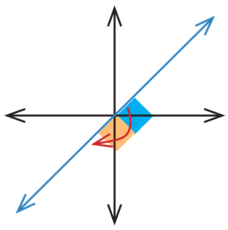
5RWWLQJ LQ WKH &RRUGLQDWH 3ODQH



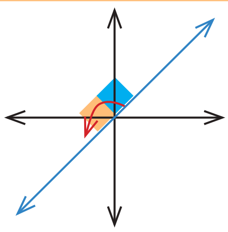
$R_{90^\circ}[(x,y)]=(-y,x)$



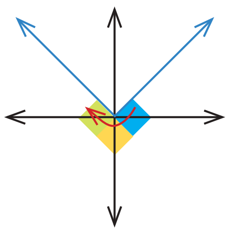
$R_{90^\circ}[(x,y)]=(-y,x)$



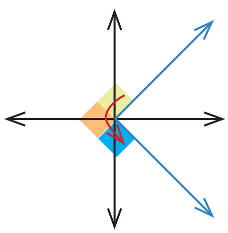
$R_{180^\circ}[(x,y)]=(-x,-y)$



$R_{180^\circ}[(1,2)]=(-1,-2)$ $R_{180^\circ}[(x,y)]=(-x,-y)$



$R_{270^\circ}[(x,y)]=(-y,x)$



$R_{270^\circ}[(x,y)]=(y,-x)$

Óäðìì Ó ãâ ãé

ÁŽØèß• –çŽÛ •«‡ ±ŽÜÌçû• Â§ Ýî£ ±ŽÜÌçû• òÓ ê—

1 A (2,2) , B (4,4) , C(4,2) x-axis ±ŽÜÌçû• Â§

2 A (-5,2) , B (-2,3) , C(-4,6) y-axis ±ŽÜÌçû

3 A (1,1) , B (2,3) , C(5,3) , D(3,1) x-axis ±ŽÜÌçû• Â§

1 3 "àŒ³û•
1 ÝŽœäàß ê'

Žì—-î2 ª Ó"ÄØèß• –çŽ

4 8 "àŒ³û•
2 ÝŽœäàß ê'Žã

"ËŽ´ß• •®ØË ²ÜË éŽ90° "óí•°'í Þ»ûå•"ÄØç Ýî£— 4

"ËŽ´ß• •®ØË éŽ 180° "óí•°'í Þ»ûå•"ÄØç Ýî£„— 5

"ËŽ´ß• •®ØË éŽ 270° "óí•°'í Þ»ûå•"ÄØç Ýî£„— 6

90° "óí•°'í Þ»û• "ÄØç Ýî£ å•A (1,-2), B(3,-2), C(1,4) ±í–çŽ 7 •«‡

"ËŽ´ß• •®ØË é

90° "óí•°' å•-í© ®ô›„— (-4,-4) Ê'®äß 2 ì4) ì2 ª Ê'®äß 8 åŽÛ

îÆ£ü— •«Žã ìê—-î» "£Ž´ãí Ê'®äß• "£Ž´ã ªŸ â› "Ë

Ýî£ ±ŽÜÌçû• òÓ ê—-î» â³-ƒ â› ò›•ª£û• ìî ãß• òÓ ÝŽ

•Žèó®âß•ªß—

ÁŽØèß• –çŽÛ •«

9 A (1,1) , B (6,1) , C(1,5) [D[LV ±ŽÜÌçû• Â§

10 A (-3,3) , B (-1,3) , C(-2,1) \ D[LV ±ŽÜÌçû• Â§

11 A (-3,2) , B (-2,4) , C(-1,4) , D(-1,2) \ D[LV ±ŽÜÌçû• Â§

Žì—-î2 ª Ó"ÄØèß• –çŽ

"ËŽ´ß• •®ØË ²ÜË éŽ270° "óí Þ»ûå•"ÄØç Ýî£— 12

"ËŽ´ß• •®ØË éŽ 90° "óí»û'•å"ÄØç Ýî£„— 13

"ËŽ´ß• •®ØË ²ÜË éŽ180° "óí Þ»ûå•"ÄØç Ýî£— 14

éŽ180° "óí•°' å•-í© ®ô›„— (1,3) ì(3,4) (3,1) "šâ›œª 15 åŽÛ

"ËŽ´ß• •-ŽØË éŽ —Ž' â› ì"

Â³î˜ã òçŽœß• Ò¼ß• •üÁ à àÒ ß 16 ²Ôä¨íß

”óí•°‘ -í³ß åÂØèß• ªèË ÒØó ñ¬ß• â

”ÄØèß• ŽäÓ ”ËŽ´ß• •-Ž20ËŽéŽ•ªØŽã‘

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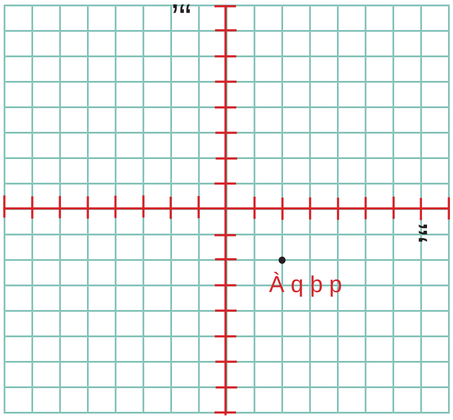

©(2-)•2 ”ÄØèß• ŽòÌÓîãŸüíŽßäß 17à³®ß•

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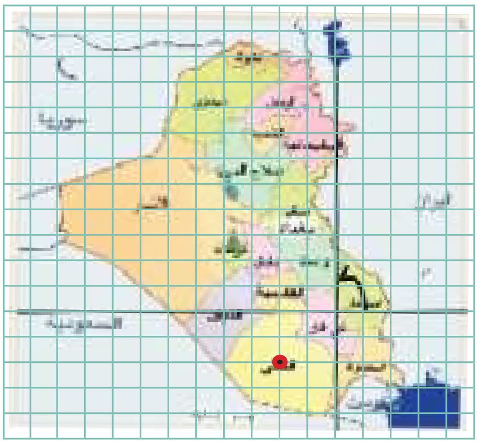

º90 ”óí•°‘ ðèœäß• ”ÈÓŽ¤ã ±Ž 18Ìç• Þ

”ËŽ´ß• •-ŽØË Êã ì”ËŽ´ß• •

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â— -î¤ã ñƒ ðàË ®¼ª ì”ÄØèàß• ”ò-Ó» ”ÄØèß• å 19 ®Ó•

î±ŽÜÌç÷•

î ”ËŽ´ß• •-ŽØË éŽ —• ²ÜË íƒ éŽ —„‘ Žì´ Ô© ªË 20 ç “-î›

ì-2 ì3 ”ÄØèß• îë •Žèô´ß• ”-ÄØèß• Ýî±ŽÜÌçƒ Äåƒß•ª 21 ã Ýî

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••©Ž¼ß• -î¤ã Ýî3±ŽÜÌç ÄØèß• ò‘Óî» •Žô›•ª£• ©

ò›•ª£û• ñîÕ´-ªß• [6-5]

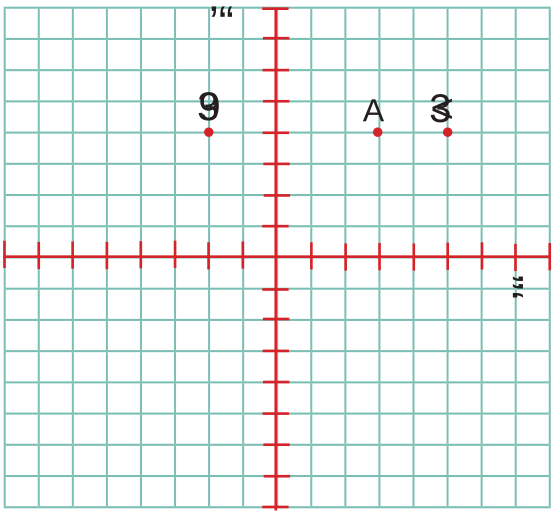
7UDQVODWLRQ LQ WKH &RRUGLQDWH 3

ðß• ”Ó®Ðß• •çŽŸ æã ”’~Ûã ñªîã´ò´ ¡•
ðàË ÝŽœã ”Û®¤ß• é¬ë ì®§õ• •çŽ ß•
•Ž¤´çû• áîìÔã •Ž¤´çû• ‡
ò›•ª£÷• ñî˜´äß•

êàÜ· •Ž³Žô× òÓ ®ôÐ— Úß« æË ž˜èó ûí éŽ®óíçû—

7UDQVODWLRQ WR 5LJKW RU /HIW >561

7UDQVODWLRQ WR 8S RU 'RZQ



•Ž¤´ç A(3,4) ”ÄØèß• •Ž(1)›•ªÝ£Ž•œãŸ

-Ž´ôß• ð5ß (ii) ••ª£íæôäôß• (ðß• åŽ

ðàË Þ¼¤— æôä A(3,4) îÄØèß•Ù

A< 3 +ì 4 A 5<4

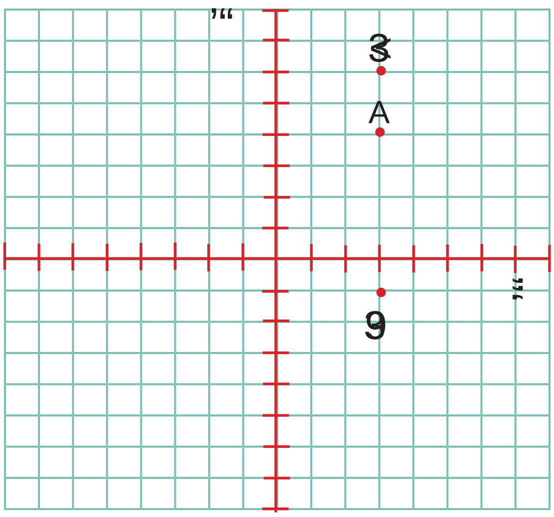
Þ¼¤— -Ž´ôß• î¤(3,4) ••ªÄíØ”ë´ß§ A

A <3 - 5 ,4 A <-2 ,4 ðàË

•Žèô´ß• -î¤ (x,y) ••Žî´ç‘• ”ãŽË “-

$T_x [(x,y)] = (x + a ,y)$

a < 0 åˆÓ -Ž´ôß• î¤ç •Ž¤ 0 çû Ó åŽÛäôß‡ î¤ç •Ž¤



•Ž¤´ç A(3,4) ”ÄØèß• •Ž(2)›•ªÝ£Ž•œãŸ

.ÞÔ³÷• ð5ß• (iii) •ª£í ðàË÷• ð(ß• åŽ—

ðàË Þ¼¤— ðàË÷• î¤”çÄ æôß•ª£Ù

A< (3 , 4 + A3, 6

Þ¼¤— ÞÔ³÷• î¤ç(3,4)•ª£ÄØ´äß• AÙ

A (3 ,4 - 5)= A <3, -1 ðàË

••©Ž¼ß• -î¤ (x,y) ••Žî´ç‘• ”ãŽË “-

$T_y[(x,y)] = (x , y + b)$

b < 0 åˆÓ ÞÔ³÷• î¤ç •Ž¤ 0 çû Ó åŽ ÛË÷« ‡î¤ç •Ž¤´ç

(3 Ý Ž œ ã

• Ž ¤ ´ ç û -Ž,4 A(" Ä Ø è ß • • Ž õ › • £ • Ý

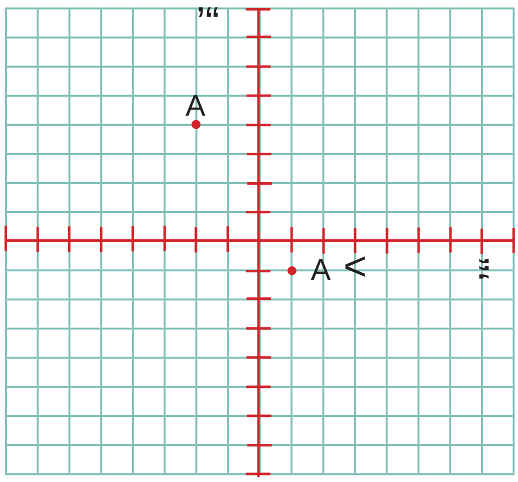
Þ Ô ³ ÷ • î ¤ ç 5 • æ ª ð á ô ß • 3 ð ß •

æ ô ä ô ß • î ¤ ç $ • -2,4 £ í " Ä Ø è ß • Ù

ð à Ë Þ ¼ ¤ è Ó Þ Ô ³ ÷ • î ¤ ç

A < -2 + 3 ,4 - 5 (A < 1, -1

Þ ‹ Ž ã • Ž ¤ ´ ç Ž ' ¤ ´ x ç • " ã Ž Ë "



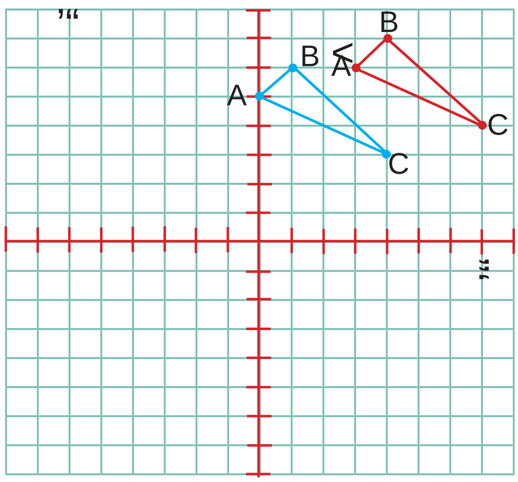
T_{xy} [(x,y)] = (x + a , b + y)

(4 Ý Ž œ ã

A (3,6 B (4,7 C (7,4 ê ³ í … - ABC š ã œ ã ß •

- Ž ´ ô ß • î ¤ ç " ' Ž ª £ ç • ª Ý

Þ Ô ³ ÷ • î ¤ ç " ª £ • í



T_{xy} > 3,6 @ 3 6 3,1 A < 6, 10

T_{xy} [(4,7)]=(4 - 3,7 - 1) = B < (1, 6)

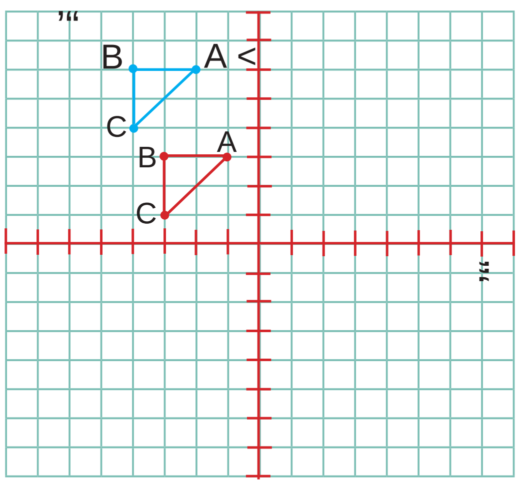
T_{xy} >7,4 @ 7 4 3,1 = C (4,3

(5 Ý Ž œ ã

A (-1,3) ì B(-3,3 C (-3,1) ê ³ í … - ABC š ã œ ã ß •

- Ž ´ ô ß • î ¤ ç " ª £ • í " ª £ í "

ð à Ë ÷ • î ¤ ç • • ª £ í "



T_{xy} > -1,3 @ -1 3 - 1,3 A < -2,6

T_{xy}[(-3,3) @ -3 - 1 , 3 + 3) = B (-4, 6)

T_{xy} > -3,1 @ (-3 - 1 1 3 C (-4,4

ûóâì Ó æê ã—

1 3 "à Œ ³ û•
1 3 "à œ ã ø ß ê ' Ž ¸ ã

ò › • ª £ ÷ • ñ î ˜ ´ ä ß • ò Ó Ž ë - î » í " ô ß Ž ˜ ß • Á Ž Ø è ß

1 - Ž ´ ô ß • î ¤ ç A (3,5) í Ê "' Ä Ø è ß • Ž ¤ ´ ç

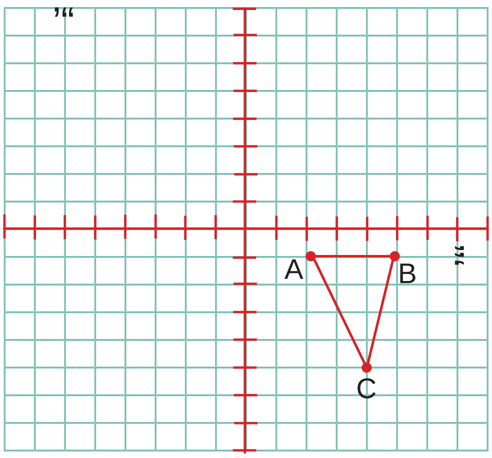
2 ð à Ë ÷ • î ¤ ç B (2,4) å Ž — ª £ í Ä Ø è ß • Ž ¤ ´ ç

4 5 "à Œ ³ ÷ •
4,5 æ ô ß Ž œ ä à ß ê ' Ž ¸ ã

3 Þ Ô ³ ÷ • î ¤ ç æ ô — ª £ í í C (2,4) ô ß " Ä Ø è ß " • Ž ¤ " ç £

4 Þ Ô ³ ÷ • î ¤ ç • • ª £ í A (2,3) › B (1,4) ä ' C (0,2) A B C š à œ ä ß • ¤ ´ ç ƒ

ò › • ª £ ÷ • ñ î ˜ ´ ä ß • ò Ó ê — - î »



5 ñ î ˜ ´ ä ß • ò Ó " ' — ® ä ß • ABC š à œ û ä © ª ¦ £ ç ƒ
å Ž — ª £ í ì æ ô 3 ô ß ' Ž ¤ ç ƒ • • ª Ÿ £ í â › ò ›
Þ Ô ³ ÷ • î ¤ ç

• Ž è ó ® â õ ß ª —

ò › • ª £ ÷ • ñ î ˜ ´ ä ß • ò Ó Ž ë - î » í " ô ß Ž ˜ ß • Á Ž Ø è ß

6 æ ô ä ô ß • î ¤ ç A (-1,2) í " › " Ä Ø è ß • Ž ¤ ´ ç

7 Þ Ô ³ ÷ • î ¤ ç B (2,4) æ — ª £ Ä Ø è ß • Ž ¤ ´ ç

8 ð à Ë ÷ • î ¤ ç å Ž — ª £ í í C (1,2) • î Ä Ø è ß £ • Ž ª £ ç

9 î ¤ ç æ ô — ª £ í A (2,3) - B (-0,3) ä ' C (-1,0) D 2,0 A B C D Ê ' ® ä ß • • ¤ ´ ç ƒ

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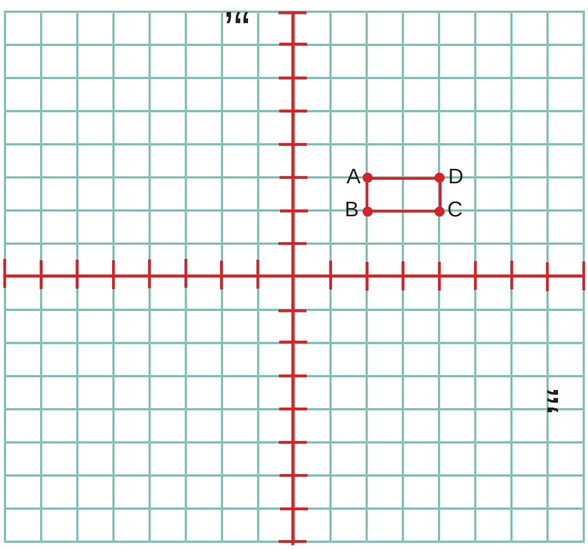

10 " ' — ® ä ß • • ABCD Þ © ª Ä ˜ â ä ¦ ´ ç ƒ
æ ô ä ô ß • ð ß ‹ Ž ã æ ð £ î ª ä ß î ' • Ž ¤ ´ ç ƒ "
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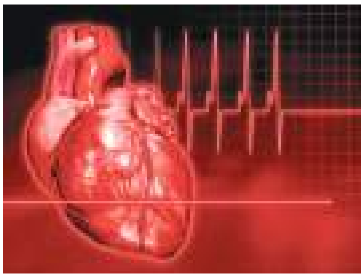
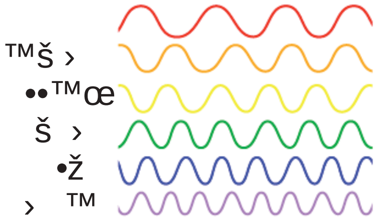
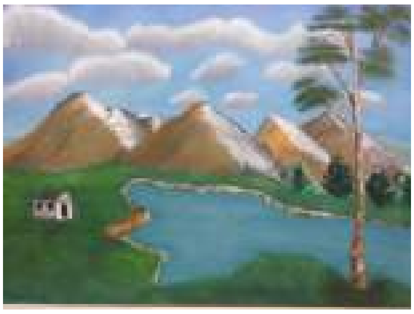


•àØßÄ¨— éŽç©ƒ ÞÜ¸ß• òØôŽ 11 âàË â
îÂÄ¨äß• •Ž¤´ç• ”ôàäË –ä— æóƒí ì
•Ž‘Ž¤´çû• ©ª



•Ž¤´ç• ”ôàäË ÙŽèë Þë ïîÀàŽŸ 12 Ÿîã Þ
îæôäôß• ”ìŸ $%&”“ªŸËíàßÛ

-25 ”ÄØèß• –çŽÛ •«ˆÓ ®¤’ŽŸ 13 ™ª
âÜØ ì“8,î¼ß• –çîÜ˜Ó ”Ÿ¶äàŸîŽ¤´çƒ -ñ
î•Ž¤´çû• •ŽìŸ òë Žãí ìÞ‹Žäß•



Þ’ß• –ä³®Ó ÝŽ’Ÿ ”Ì‘-• æãð³ 14 ’Ÿ ”à
Ýíû• Þ’àß •Ž¤´ç• “-î» ÞÜ¸‘ òçŽœß•
•«‡ Þ’ß• •Ž¤´ç• “-î» ŽäÓìðàËû• ðß
. A(3,3) B(3,0) C(0,0) Ýíû• Þ’ß• ÁŽØç

ðß

ðàËû• ðß•ìæªôß ðŽ¤“ŽŸ‘ ”ÄØèß• •Ž 15 ª£• Ž
–çŽÜÓ ” —Žèß• “-î¼àß ®§• •ŽÄØèß ŽŽ 16 àË
Ú˜‘ŽŸ• ®´Ó î æô‘Ž¤´ç• ï•®Ÿ‡ ªÌ‘ ”ô‹Žìß• Ä“Øî¼ß
A(2,-1) B(3,-) C(2,-4) D(1,-3) ê³í… -ABCD ßæôÌäàß •Ž¤´ çò ”ï 17 Ë‡ ª
•Ž¤´çD• ©Ì‘B Ò»A (4,-3) •Ž¤´çA•±ƒÌ®ß• ò›•ª£•

ø˜ ô

”ß„´äß• Þ£ Ž›Ž¤æçôÌŽìÞÜ¸ß äÌ˜´ — ”

Chapter Test

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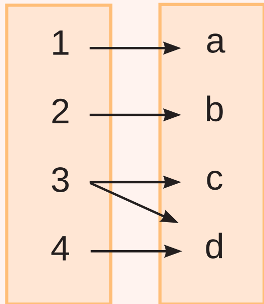
1



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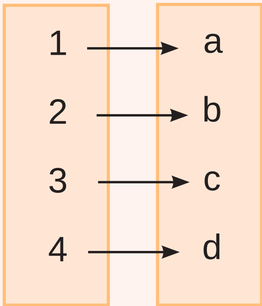

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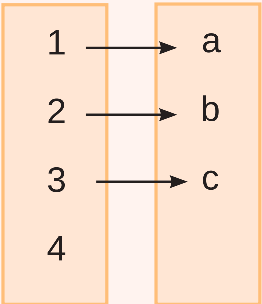


Á Ž Ø è ß • æ ô ‘ Þ » â › î ò › • ª £ û • ñ

4

X	1	2	3	4
Y	20	40	60	80

5

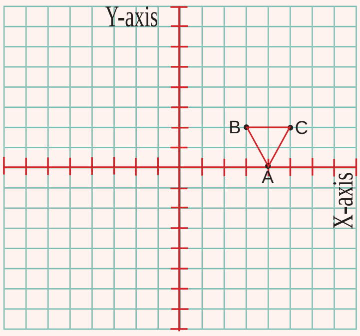
X	-1	0	1	2
Y	4	5	6	7

6 ” ß • ª ß • “ ª Ë Ž × ª • Ž Ÿ

Ž ì à

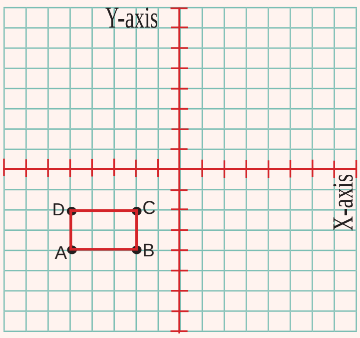
X	-2	-1	0	1
Y	-3	-2	-1	0

7 î Ž ì ô à Ë Þ 90¤ ” ð í ò 3 ß ì 2 ” Ä Ø Ø è ß • Ž • Þ í ’ ©



8 4 í Þ Ô ³ û • ð ß • “ ª £ î ‘ Þ Ü ¸ ß • • ¤ ´ ç •
- Ž ´ ô ß • ð ß •

9 Ž ë - • ª Ø ã ” ó í • Þ Ü ¸
” Ë Ž ´ ß • • - Ž 2 Ø Ë é Ž



7 ð ¼ Ô

Statistics and Probabilities • û Ž ä ˜ £ û • í ï

• î è Ü ä ˜ ô ß Ž ë ® ô ´ Ô — í " Ô à ˜ ¨ ã Ö ‹ • ® Ä ' Ž ì à ô œ ä — Ý ü §
Ž ì ã • ª ¨ ˜ ³ • í • • - Ž ô ˜ § ÷ • Þ

”¤ô¤» ”àäŸ åîÜ— òÜß “-íŽ äß• ••©

1 ” òÓ äß ”Ëîä “ŽÄÌäß•   Ý•îèäß•

2 Ž òÓ äß ”Ëîä “ŽÄÌäß•   Âô³îß•

3 ò’ß• Žç• “ŽÄÌäß• ªÌ‘ —®—ô’ÌŽ —¼íŽ Ë—ªèŽ¯ ßôŽ ïªäß•

4 ´Žíò ä Éîä •ßØôËä ßàÌÄŽ©ëŽØ ´îãŽ   Âô³îß• •ß¤´Ž‘ò

àòãæ ¼ŽËÐóØŽ •ß ð •÷Û’®

5 9 ì7 ì6 ì9 ì8 ì8ì6 ì9

6 97 ì99 97 97 ì100 ì99 90 ì90 97

ôæ •ßØî³ôæ ßÜÞ ãäŽ ó„—ò

7 ì’ó ßÌ®•Õ   ãäÜæ ì ãÛÛª

8 “ £äß • ïãæ Ûô² ÓôÛ ®••ÓòØ¾ ëò (0% ¡50%

9 ÄŽ×®Ž •ßãæ 1 ßß • 9- ×Žá ¯íŸô” ëò (0% ¡50 % ãæ • ×Þ

10 • ÛŽ ßÞ ªŽ©Õ • ßî ßŽ ª ©ÓŽå • ßÌª© ëî (34 ¡43

11 äŽ ŽíÞ ®ÄÜ® óØ” •ß´ŽÕ í•ßî-×”

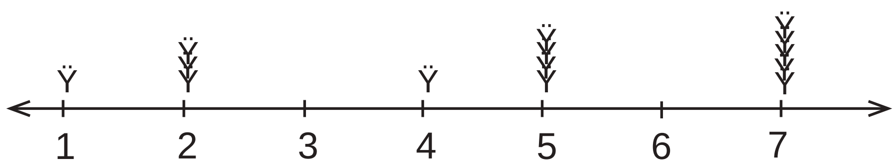
65	70	68	76	65
72	69	74	71	69
76	65	71	72	68

Ý í•ßäª ï ßÜÞ ãäŽ ó„—ò

12 2¡ 6¡ 1¡ 8¡ 3¡ 2¡ 0¡ 5¡ 4

13 77ì 71ì 12ì 15ì 55ì 30ì 87

14 Þ •ßäŽí- ‘ŽßèØŽÁ



ïªäß•í ”ó°Û®äß• ”Ë°èß• ±

Measure of Central Tendency and Range

[7-1]

•ŽŸ-© -íŽ äß• Ýíª ß•
Â³î˜ã òçŽœß• Ò¼ß• •üÁ
ªŸíƒ •Žô¿Žó®ß• “©Žã îòÓ í
Âô³î2ß• ð ïªäß• ð1 ••©®Ôäß•
ò‘Ž´¤ß• Â³î˜äß Ý3ðèäß• ð

•üÄß• •ŽŸ-©				
95	90	85	90	98
88	81	90	79	79
72	90	99	94	75

±-ªß•©®Ô

”Ë°èß• ±ŽôØã ©
ïªäß• í ”ó°Û®ä
ÕŽ´ßŽ‘Ž¤ô œ´ã˜ß•
Õ Ž´ß• ‡ Â³î˜ä
”×-îß• ‡ Âô³î
Ý•îèäß• ‡
ïªäß• ‡

Þôœä— âàÌ˜è³ ±-ªß• •¬ë òÓ ì “ª£•í ”Ëîä ŽØ‘Ž³à-Ìîß•
æã ”ó°Û®äß• ”Ë°èß• í –˜¸˜ß• ²óŽØã ©Ž ó• ÚèÜäóí
”×-îß•í ÕŽ´ßŽ‘ Þ

âàÌ— “®ØÓ æË ”‘ŽŸüß ”×-îß•Ý ŽŒ ãß (1)
Žóª ËŽ¼— Žì’ô—®— ªÌ‘ •Žç Žô’ß• ½®ïßÄ’§× -

••®¸Ìß• ”’—®ã	ŒŽŽ£ß• ”’—®ã Õ•-í÷•
7	2 5 9 9
8	1 5 8
9	0 0 0 0 4 5 8 9

æË ”‘ŽŸüß ”×-îß•í ÕŽ´ßŽ‘ 2 ïÄ ß ô

72 ï®Ð¼ß• ”äôØß 99 ®’Üß 1 ”äôØ

ï®Ð¼ß• ”äôØß• ï®’Üß• ”äô

99 72 ïªäß•

27

”×-îß• í ÕŽ´ß• Ýíª ß• òÓ •Žç Ž 90ß• Âô¼ 2 èäß•

ñ-•®Ü— ®œÛû• ”Ÿ-ª 3 òë

$$\frac{99 + ... 75 + 72}{15} = \text{ñíŽ´ó ò‘Ž´¤ 4 • Â³î}$$

87 =

”×-îß•í ÕŽ´àß •í©°äß• Þôœä˜ßŽ‘ •Ž

ïŽó°ôÔß•í •Žô¿Žó®ß• ò—©Žã òÓ •üÄß• ¾Ì‘ (2Ž ÝŸ-Žß• ã×

”×-îß• ïŽó°ôÔß•	ÕŽ´ß•	”×-îß• •Žô¿Žó®ß•
8 5 1	7	3
9 8 4 4 2	8	0 2 3 3 7 8
9 6 5 3 0	9	0 0 1 5 6 7

î ®’Û• é•ªã æÌô Ëî¿

97 73 = 24 •Žô¿Žó®ß• ”Ëîä

99 71 = 28 ïŽó°ôÔß• ”Ëîä

•Žô¿Žó®ß• ”Ëîä ã ïªã æã ®’Û• ï

88 îìÓ ïŽó°ôÔß• ”Ëîä ëã •Žô¿Žó®ß• ”Ëîä 81

97 î •Žô¿Žó®ß• Éî¿îäß• LÌLÓ

71 î ïŽó°ôÔß• Éî¿îãLÌ ÝÓ ”

Öó®Äß• ðàËí ”èóªäß• Þ§•©Ø®˜ãî˜ßôÜ”ÓŽ´äß•(3Ž ð³ÝŽ ã-

éŽç©ƒ Ýíª ß• åŽÜÓ á

									•• ®˜ãîàôÜßŽ‘ ”ÓŽ´äß•
28	23	41	31	20	19	23	31	34	”èóªäß• Þ§•©
28	38	32	41	38	28	32	30	27	áŽÌß• Öó®Äß•

Žäìèã ÞÜß ïªäß•í Ý•îèäß•í ŽÂô³îß• éŽç©ƒ ’ßŽ‘ ”×-îß•í ÕŽ

”èóªäß• Þ§•©	áŽÌß• Öó®Äß•	
28	32	Âô³îß•
23 , 31	28,32,38	Ý•îèäß•
41-19=22	41-27=14	ïªäß•

”èóªäß• Þ§•©	ÕŽ´ß•	áŽÌß• Öó®Äß•
9	1	
8 3 3 0	2	7 8 8
4 1 1	3	0 2 2 8 8
1	4	1

î®’Ûƒ é•ªã æÌô ĽËîä

22 Žë•ªã ”èóªäß• Þ§•© •

14 Žë•ªã áŽÌß• Öó®Äß•

®’Ûƒ Žë•ªã ”èóªäß• Þ§•©

”ó°ôàôà³ “-•®¤ß• •ŽŸ-©				
24	30	36	32	38
2	31	35	13	15
38	32	38	38	13

á Žó÷• ¾Ì'ß “-•®¤ß• •ŽŸ-© ä

1 •ŽçŽô'ß• Þôœä˜ß ”×-î •í ÕŽ

2 •ŽçŽô'àß Ý•îèäß•ì Âô³îß•

3 •ŽçŽô'àß ò'Ž´ß• Â³î

(1 3 ”àŒ³÷•
1 ÝŽœäàß ê'Ž¸ã)

“®Û ”'Ìß òÓ ”ô³-ªäß• Õ®Ôß• æã æô˜Ëîä ã ŽìôàË Þ¼£
”à´ß•

(2 ”Ëîä äß•	õŽ´ß•	(1 ”Ëîä äß•
0	4	7 8 8
6 4 3 1	5	0 0 2 3 7
9 8 6	6	1 6
2 1	7	
3	8	4

4 ðßíû• ”Ëîä äß• •ŽçŽô'ß Ý•îèäß• ì

5 î ®Ð»ƒ é•ªã ä˜Ëîä

6 æô˜Ëîä äàß æô³îß•

7 ì ïªäß• ªŸ â› ”×-îß•í ÕŽ´Ž' •í©

(4 6 ”àŒ³÷•
2 ÝŽœäàß ê'Ž¸ã)

æôËîèß• •ŽçŽô'ß Ý•

8 î®'Ûƒ Žë•ªã æô˜Ëîä

••®ä˜è´ßŽ' •Ž—Ž'èß• Ý•îÁƒ							
49	64	72	63	45	52	43	Ýí÷• Éîèß•
54	58	54	64	58	52	61	òçŽœß• Éîèß•

(7 8 ”àŒ³÷•
3 ÝŽœäàß ê'Ž¸ã)

•Žèó®ä ãðªß•—

ÕŽ´ß•	”×-îß•
0	8 9
1	0 2 4 6 8
2	7
3	4

ò—„ó Žã ªŸí -íŽ äß• ”×-îß•í

9 •ŽçŽô'àß Ý•îèäß• ì Âô³

10 •ŽçŽô'àß ò´¤ß• Â

æôßŽ˜˜ã æôËî'³• òÓ ñ©•ªÐ'ß• Ò¤˜ä

ñ©•ªÐ'ß• Ò¤˜äß• -•í¯ ©ªË							
58	61	70	63	36	50	44	Ýí÷• Éî'³÷•
50	59	70	66	30	52	40	òçŽœß• Éî'³÷•

11 •ŽçŽô'ß• Þôœä˜ß ”×-îß•í Ž´ßŽ'

12 Ýíû• Éî'³û• •ŽçŽô'ß Ý•îè• ì Âô

13 Ú˜'ŽŸ• ®´Ó î Æ£ü— •«Žã Éî'³ÞÜß •

ñô—ßŽ‹ŽÐ㠬ø ª—

Km/h ••-Žô´ß•				
69	65	71	76	65
59	74	68	74	72
70	65	69	71	68

"Ë®³ Õ®Äß• ðàË ••-Žô´ß• ¾Ì' "Ë®³ æô'

14 •ŽçŽô'ß• Þœä˜ß

15 •ŽçŽô'àß Ý•îèäß ì Âô³

16 •ŽçŽô'àß ò'Ž ß• Â

%•ŽŸªß•í â¤àß•		
•ŽŸ©	ÕŽ´ß•	â¤ß
1	0	8 9
9 5	1	0 2 4 6 7
7 6 5	2	7
4 3	3	
1	4	0

®‹ŽÄÓ òÓ æëªß• "ôäÛ

ò—„ó Žã ªŸ•í -íŽ äß• "×-ãŽ•íÁ Õ

17 î Éç ÞÛ

18 î "ãŽË "-î¼' æëªß• æã Þ• "ôä

19 . Žäìèô' å-Ž×í æô— ôÄÔß

ø®Ô

á•®Ï îàôÜßŽ' å¯îß•	
ÕŽ´ß•	"×-îß•
3	4 5 6
4	
5	6
7	2 8

20 Ý•îèäß•í Âô³îß• ²Ôç ŽŽœ• Žô'

21 ©•îäß• ¾Ì' å•¯íƒ Þœäó -í äß• Ý

ÕŽ´ßŽ' "àœääß• •ŽçŽô'ß•

á•®Ï 30 40 Ûæô' å•¯íû• Ò¼ç å• ªä¤ã

Žäìóƒ å 70 ®ë Ëàªó Ûó å¯í ñ•ªŸîó û ê

Ú˜'ŽŸ• ¢¿í î ••î»

22 •Žô¿Žó®ß• Éî¿îã òÓ æô˜'Ì· åŽ¤•Ž ©ŽŸ-

23 •Ÿƒí "×-îß•í ÕŽ´ßŽ' •í©°ä Þôœ

24 î $ "'

25 î % "'Ì· ò Ý•îè

î®Ð»ƒ Žë•ªã æô˜

æô˜'Ì¸ß• •üÁ •ŽŸ-©							
66	81	73	52	77	80	90	A "'Ì¸ß•
80	60	99	60	84	66	90	%"'Ì¸ß•

ø˜ ð

ìïªäß• ©Ž óû êßŽäÌ˜³• ÚèÜäó ÒôÛ ¢¿í ì "×-îß•í ÕŽ

Ý•îèäß• ì Â

[7-2]

æô'-Ž¸ß• åŽô'' •ŽçŽô'ß
Representation of Data by Box - whisker

"ôßŽ˜ß• ÁŽØèß• "•-Ž'ã ÞÛ òÓ "à´ß• "®Û ð Ëû ª£ƒ

ì38 ì35 ì 40 ì 37 ì35

40 ì37 ì 42 ì 46 ì46

î æô'-Ž¸ß• åŽô'' •ŽçŽô'ß• Þœã ƒ ®Ô

åŽô'' •ŽçŽô'ß•
æô'-Ž¸ß•
æô'-Ž¸ß• æô' "ç
••©®Ôäß•
æô'-Ž¸ß• åŽô
ðàËû• Êô'®ß•
ðç©÷• Êô'®ß•
òÌô'®ß• ïªäß•

%R[DQG ZKLVNHU *UDSK æô'-Ž¸ß•>åŽô

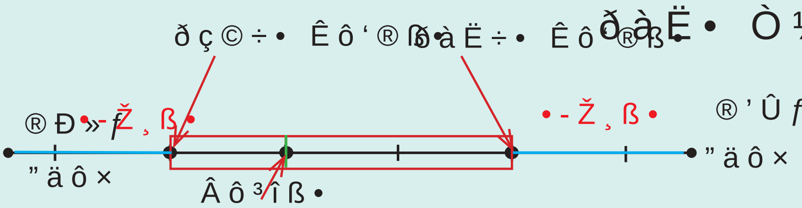
Âô³îß• ì •ŽÌô'®ß• ÝŽäÌ˜³Ž' ì áŽ´×• "Ì'-• ðß• ŽÌ'ô—®

ðàË• Ò¼çí ðç©÷• Ò¼ç ðß• •ŽçŽ

ðç©û• Êô'®ß• îë

ðàËû• Êô'®ß• îë ðàËû

©•ªËû• âôØ˜´ã ðàË É¯î



"ô—õ• •ŽçŽô'àß æô'-Ž ÝŽœã åŽô

40 ì 37 ì 42 ì 46 ì 46 ì 38 ì 35 ì 40

ðç©û• Êô'®ß• Žëªì'í Âô³îß• â› ï®'Üß•í ï®Ð¼ß• "äô

ðàËû• Êô'®

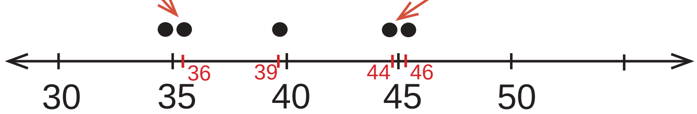
"äô× ®Ð»ƒ 35 | 35 ì37 | 37 | 38 ì40 | 40 | 42 ì46 | 46 "äô× ®'Ûƒ

ðç©÷• Êô'®ß• | Âô³îß• | ðàË÷• Êô'®ß•

$\frac{35+37}{2}=36$ | $\frac{40+38}{2}=39$ | $\frac{42+46}{2}=44$

ê×îÓ Ê¿ƒí ©•ªË 2 • "ãÄØß´ã

1 "îÄ¨ß• òÓ •ªŸí "äô

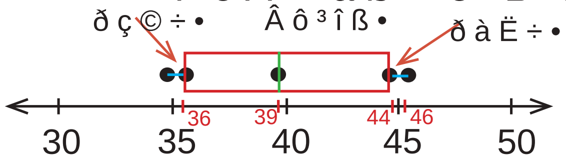


Â§ ÞôÄ˜´äß• Þ§•© â³-• ðàËû• Êô'®ß• ªèË 3 ïŽ'îÄ¨ß •

ÞôÄ˜´äß• ð˜£ ï®'Üß• "äôØß•í ï®Ð¼ß• "äô× æã

ðç©û• Êô'®ß•

ÞôÄ˜´äß• Ý8î Á 44 í Ž36 ó òÌô'®ß• ï



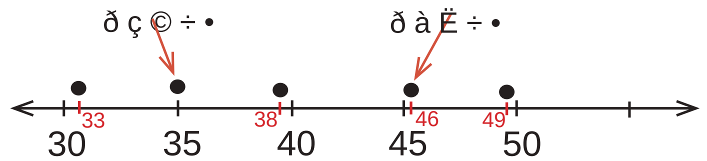
”ô—õ• •ŽçŽô’àß (2æô Ý-Žœå Ž

37 ì 46 ì 35 ì 40 ì 42 ì 46 ì 38 ì 49 ì 3

ðàËû• Êô‘®ß•í ðç©û• Êô‘®ß• Žëª Ì‘í Âô³îß• â› ï®’Ü

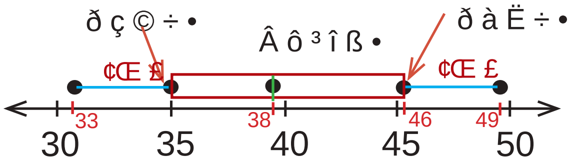
”äô× ®’Ûƒ 33 | 35 ì 35 | 37 ì 37 | 38 | 40 ì 42 | 46 ì 46 | 49 ”äô× ®’Ûƒ

ðç©÷• Êô‘®ß• — 35 | Âô³îß• — 38 | ðàË÷• Êô‘®ß — 46



”äô× ÞÜß ”ÄØç ê×îÓ Ê¿ƒí

Ýªó âôØ˜´ã Â§ ÞôÄ˜´äß• Þ§•© â³-• ì ðàËû• Êô‘®ß•
ÞôÄ˜´äß• ð˜£ ï®’Üß• ”äôØß•í ï®Ð¼ß• ”äô



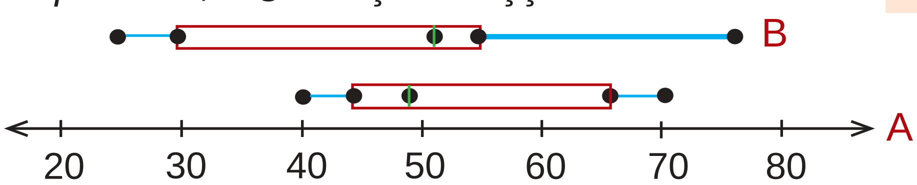
ðç©û• Êô‘®ß• ðà

ÞôÄ˜´äß• Ý46Á 35Ž´ 11 òÌô‘®ß• ï

&RPSHUHU ÉRI ÉR[ZKLVNHU ô‘-Ž¸ß• ÝŽà Þ7³2„

®§õ• “•«Ž¤ä‘ Žäëª£ƒ Ê¿î‘ Úß«í •ŽçŽô’ß• æã æô˜

¦’Ääß• ••í©ƒ æã $Ž§%ÉÛç®•Ž•Žç÷Žô‘ É¯î˜— ÒôÛ3éŽÝçŽœƒ ãæ



ò—„ó ŽäË •Ÿƒ -íŽ äß
æã ®’Ûƒ % ”Û®¸ß• Âô³í î ®’Û
$ ”Û®¸ß• Âô
”Û®¸àß òÌô‘®ß• ïªäß• î®’Û• òÌ
®’Ûû• îë
òÌô‘®ß• ïªäß• Þœäó æô‘-Ž¸ß•
î ®œÛ• ••í©• ž˜è˜³ a

ïªäß•í ïªäß• æã ®Ð»• Žäë $ ”Û®· å
%”Û®¸ß• •ŽçŽô‘ òÓ”Û®çß•˜ßŽçæã‘Þò×© ®$ôÛÐ˜ßå•Žä‘ òÉÌ
®œÛû• åî$Üó”Û•®æÜŽ˜ã

Ðàì Ó ãà—

”ô—õ• •ŽçŽô’àß æô

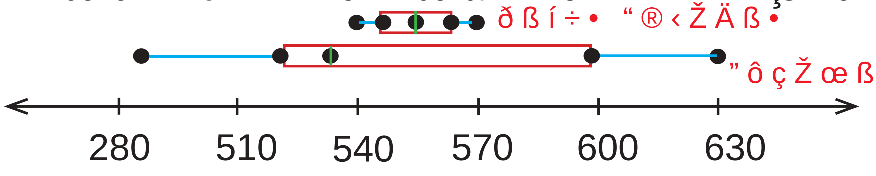
1-3 ”àŒ³÷•
ì æôßŽœààß ê‘Ž¸ã

1 ì28 ì 19 ì 21 ì 17 ì29 ì20 ì26 ì 23 ì17

2 85 ì79 ì 75 ì72 ì72 ì73 ì76 ì81

3 16 ì 26 ì 17 ì 23 ì21 ì 14 ì17 ì25 ì10

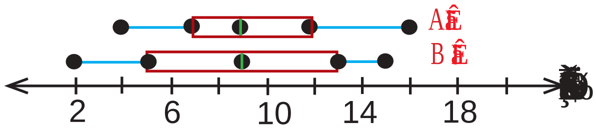
æô—®‹ŽÄß• æã ÞÛ Žì‘ ŽìçŽô‘•Þœãß• •ŽçŽ˜àß•íæãŽ‘



4 î Þ×• Äô³í

5 î ®’Û• òÌô‘®ß• Žë•ªã

6 îÞ×ƒ ”ÓŽ´ã ®ôÄ˜³ ìç•



7

4-8 ”àŒ³÷•
3 ÝŽœààß ê‘Ž¸ã

8 % Êä äß• A• íÊä©ªË• Êãí¯ ©ªÌß òÌ ®ß•

•ŽèóÞäõßª—

”ô—õ• •ŽçŽô’àß æ

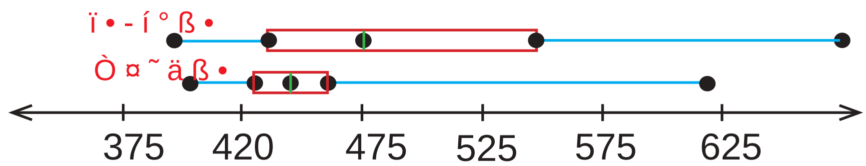
8 39 ì18 ì15 ì20 ì8 ì15 ì23 ì7 ì10 ì13 ì12

9 22 ì18 ì17 ì18 ì25 ì24 ì24 ì18 ì29 ì23

10

7	6	5	4	ÕŽ´
2	3 4	2 7	3 5 9	”×-îß•

áŽóû• ¾Ì‘ òÓ ñ©•ªÐ’ß• Ò¤˜äß•í ï•-í°ß•



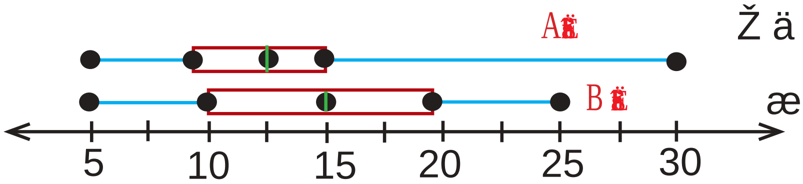
11 î ®’Û• ”Äô³í ëôçŽ

12 î ®’Û• òÌô‘®ß• Žë•ªã

13 î -•í°ß• æã ®’Û• ©ªË Þ ´ó ê

14 $ %æô˜Ëîä äß• æ -Ž¸ß•

15 Žäìèô‘ å-Ž×í æô˜Ëîä äß• ü



16 æô˜Ëîä äß• æã ÞÛ Ó òÌô

Žäìèô‘ å-Ž

ñô ÞŽ‹ŽÞã ó ª

17 ñôßŽŸ ±Žô× ñ-•®Ü˜ß•² Ýû ß• Þ

65	54	52	50	48	±ŽôØß•
1	2	2	4	3	-•®Ü˜ß•

æô‘-Ž¸ß• åŽô’‘ éüË

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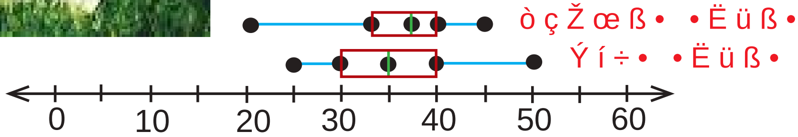

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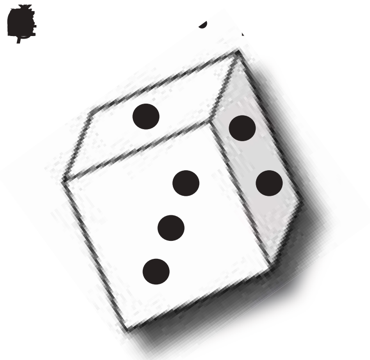

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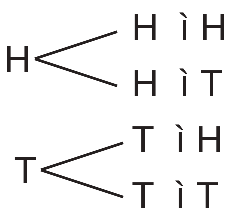

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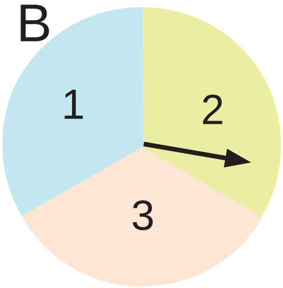

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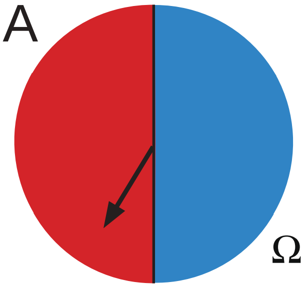

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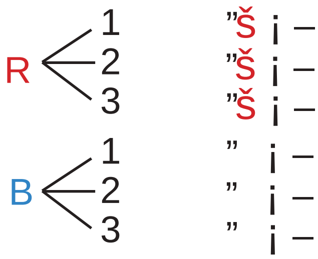

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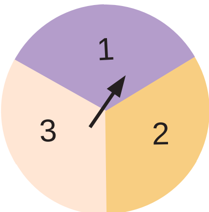

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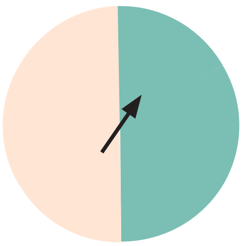

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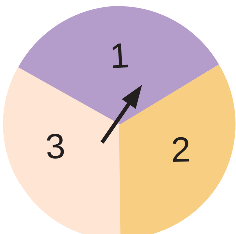

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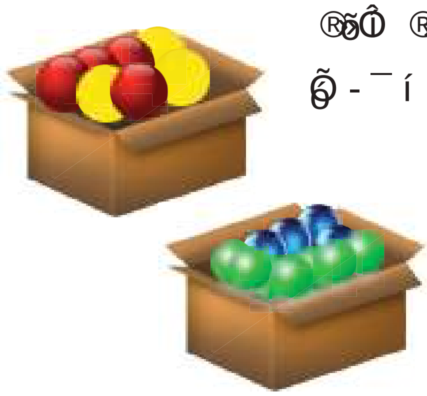

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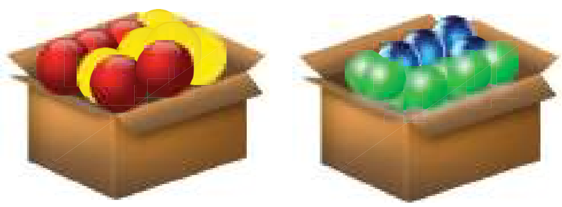

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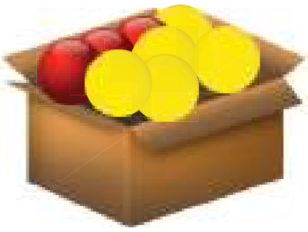

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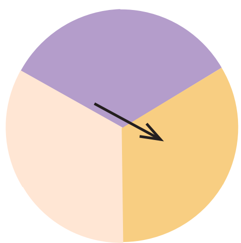

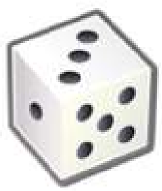

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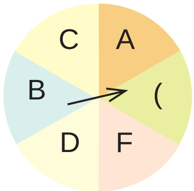

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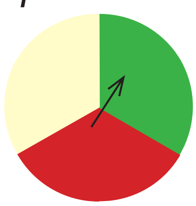

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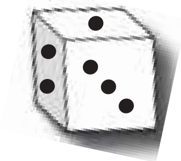

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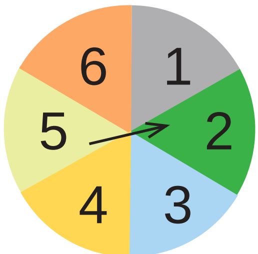

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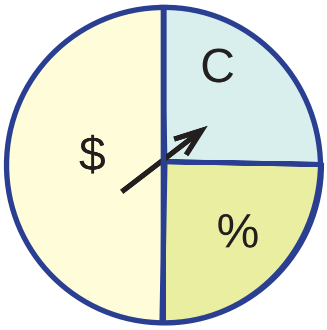

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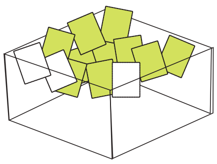

"×ŽÄñƒ ïŽÀô'3 •Ž×®À§ ïŽ×ŽÄ'Õíªè¼ß• ñ 23 10

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"×ŽÄåõ• Õíªè¼ß• òÓ åƒ òèìó •¬ë ì Õíªè¼ß• 12

$$P\ \text{ïŽÀô'} = \frac{\text{ïŽÀô'ß• •Ž×ŽÄ'ß• ©ªË}}{\text{•Ž×ŽÄ'àß õàÜß• ©ªìß•}} = \frac{3}{12} = \frac{1}{4}$$ îë ïŽÀô' "×ŽÄ' òßŽ³

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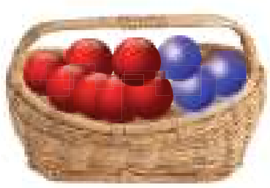

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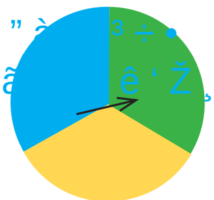

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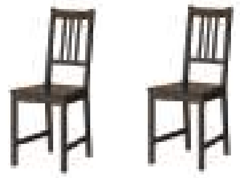

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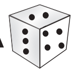
20 î6 ®ôÏ ©ªË-îìÅ  Žä˜£•ƒ Ž®ãì ©®è®ç £ òã
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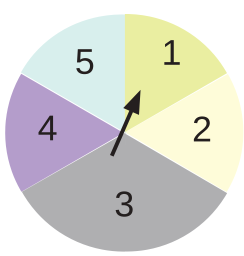

29 . A ìB ìC ž‹Žãçã Òß„˜— ”èôË ïŽÀÓ òÓÞ èÜää

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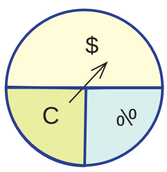

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$$P(A) = \frac{13}{50}$$ 50 ••®Üàß 13 àÜ•®Ô¼ßß ••®Üß• ©

26% íƒ $0.26 = \frac{13}{50}$ •îë ï•®Ô» “®Û •¤³ ÝŽ

ò—„ó ŽäË 8 ŸƒîØìç•ò®ìãÄ× òã- ž‹Ž˜ç æô’ó ñ (4 ß• ÝŽœã

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25 íƒ $0.25 = \frac{1}{4}$ 6 ñ®Èèß• ÝŽä˜£û

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$$P(H\ ìH) \approx \frac{\text{(H ìH) -îìÅ ©ªË}}{\text{”‘® ˜àß òàÜß•©ªÌß}} = \frac{3}{8}$$

$37.5\% = 0.375 = \frac{3}{8} \approx$ ò’ó® ˜ß• ÝŽä˜£

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Þ » ƒ ¾ ƒ 380 å ƒ í © î ³ ƒ ï 200 £ Þ ä ƒ ô ä ß Ž Å ƒ ” ô ‹ Ž ¼ £ ƒ ” ô 22 © • ª Ý

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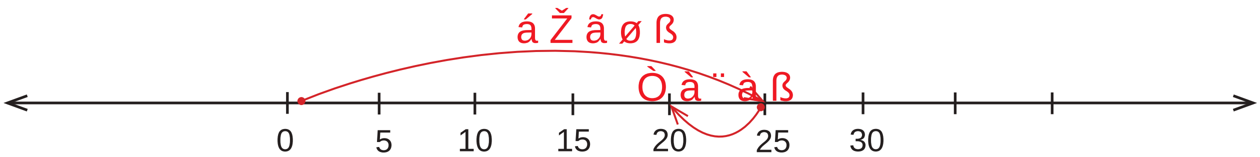

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25 5 = 20m
100 ÷ 20 = 5

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10. îïŽ×-¯ "×ŽÄ' •¤³ ÝŽä˜ß•ÔŽã•ŽÕèŽÓ•ŽÄ»

Ý î ¼ Ô ß • • Ž è ó ® ä

1. $2\frac{1}{3} + 1\frac{1}{5} - \frac{6}{15} = \ldots$ a) $\frac{15}{47}$ b) $-\frac{15}{47}$ c) $\frac{47}{15}$ d) $\frac{47}{15}$
2. $6.13 - 5.02 + 1.5 = \ldots$ a) 2.16 b) 2.61 c) -2.16 d) 2.61
3. $1\frac{1}{4} \times (-2\frac{1}{2}) \div 3\frac{4}{2} = \ldots$ a) $\frac{3}{8}$ b) $-\frac{3}{8}$ c) $\frac{8}{3}$ d) $-\frac{8}{3}$
4. $4.3 \times 1.2 \div (-0.4) = \ldots$ a) 12.9 b) 10.92 c) 19.20 d) -12.90
5. $\frac{-2}{6} \times \frac{12}{-3} - \frac{1}{3} \times \frac{15}{2} = \ldots$ a) $-\frac{7}{6}$ b) $\frac{6}{7}$ c) $-\frac{7}{6}$ d) $-\frac{6}{7}$
6. $\frac{1}{9} \div \frac{5}{36} \times \frac{1}{-2} + \frac{7}{2} = \ldots$ a) $\frac{31}{10}$ b) $\frac{31}{10}$ c) $\frac{10}{31}$ d) $\frac{10}{31}$

1. 4^{-2} a) $\frac{-1}{8}$ b) $\frac{-1}{16}$ c) $\frac{1}{8}$ d) $\frac{1}{16}$
2. $(7)^{-2} - (-1)^{4} + 1^{-7} - \frac{1}{7} = \ldots\ldots$ a) $\frac{-6}{49}$ b) $\frac{-114}{49}$ c) $\frac{6}{49}$ d) $\frac{114}{49}$
3. $3.4 \times 10^{5} = \ldots\ldots$ a) 300040 b) 300400 c) 304000 d) 340000
4. $2.51 \times 10^{-3} = \ldots\ldots$ a) 0.00251 b) 0.00215 c) 0.00125 d) 0.00512
5. $52100 = \ldots\ldots$ a) 5.21×10^{3} b) 5.21×10^{4} c) 5.21×10^{5} d) 5.21×10^{6}
6. $0.0035 = \ldots\ldots$ a) 3.5×10^{-6} b) 3.5×10^{-5} c) 3.5×10^{-4} d) 3.5×10^{-3}

1. $-7^3 \times 7^{-4} \times 7^0 = ...$ a) 7^{1} b) 7^{0} c) -7^{0} d) -7^{-1}

2. $4^{-2} \times 16^{-2} \times (-32)^2 = ...$ a) -2^{-4} b) 2^{-4} c) 2^{2} d) -2^{-2}

3. $\frac{(-27)^2}{(-9)^3} = ...$ a) 3^{12} b) -3^{12} c) -1 d) 1

4. $\frac{(-32)^0}{(-2)^3} = ...$ a) -2 b) 0 c) -2^{-3} d) 2^{2}

5. $\frac{-5^3 \times 4^3}{4^2 \times 5^6} = ...$ a) $\frac{5^{-3}}{2^2}$ b) $\frac{5^3}{2^{-2}}$ c) $\frac{2^2}{5^3}$ d) $-\frac{2^2}{5^3}$

6. $\frac{7^{-6} \times 7^0 \times 9^{-2}}{(-7)^2 \times 3^2 \times (-1)^0} = ...$ a) $\frac{7^{-8}}{-3^6}$ b) $\frac{7^{-8}}{3^6}$ c) $\frac{3^{-6}}{7^8}$ d) $-\frac{3^2}{7^8}$

1. $\frac{3}{8} + \frac{5}{9} = ...$ a) $0.39\overline{0}5$ b) $0.93\overline{0}5$ c) $0.\overline{5}903$ d) $\overline{0}.9035$

2. $\frac{8}{9} \times \frac{36}{48} \div \frac{-6}{21} = ...$ a) $\overline{2}.3$ b) $-\overline{2}.3$ c) $\overline{3}.2$ d) $-\overline{3}.2$

3. $(4.2 \times 10^5)(3.6 \times 10^{-4}) = ...$

a) 1.251×10^2 b) 1.152×10^2 c) 1.512×10^2 d) 1.125×10^2

4. $\frac{6.25 \times 10^7}{2.5 \times 10^{-6}} = ...$

a) 2.5×10^{13} b) 2.5×10^{-1} c) 2.5×10^{-13} d) 2.5×10

1. $\frac{\sqrt[3]{-1}}{7} \times \frac{35}{10} + \frac{2}{7} \times \frac{-21}{\sqrt[3]{8}} = ...$ a) $-\frac{7}{2}$ b) $-\frac{5}{2}$ c) $\frac{2}{7}$ d) $-\frac{2}{5}$

2. $\frac{4}{\sqrt{81}} \div \frac{20}{10} - \frac{\sqrt[3]{-27}}{12} \div \frac{-3}{8} = ...$ a) $-\frac{4}{9}$ b) $\frac{4}{9}$ c) $\frac{9}{4}$ d) $-\frac{9}{4}$

3. $\frac{1}{2^3} \times 2^5 \div (-1)^{-4} \, (2)^{-2} = ...$ a) 2^{-5} b) 2^6 c) 2^{10} d) 2^{-10}

4. $3.2 \times 10^4 + 0.22 \times 10^5 = ...$

   a) 0.54×10^4 b) 0.45×10^4 c) 0.45×10^5 d) 0.54×10^5

5. $8.3 \times 10^6 - 0.57 \times 10^3 = ...$

   a) 5.671×10^4 b) 5.617×10^4 c) 5.617×10^{-3} d) 5.671×10^3

1. $\sqrt{13}$ a) b) c) d)

2. $\sqrt{\frac{4}{36}}$ a) b) c) d)

3. $\sqrt{\frac{2}{18}}$ a) $\frac{\sqrt{2}}{6}$ b) $\frac{2}{18}$ c) $\frac{1}{3}$ d) $\frac{2}{\sqrt{2}}$

4. $\sqrt{5}$ § « D E

5. $\sqrt{7.6}$ § « D E

6. $-\sqrt{17}, -4\frac{1}{5}, -4.02$ a) $-4.02, \sqrt{17}, -4\frac{1}{5}$ b) $-4.02, -4\frac{1}{5}, -\sqrt{17}$

   c) $\sqrt{17}, -4\frac{1}{5}, -4.02$ d) $-4\frac{1}{5}, -\sqrt{17}, -4.02$

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1. a+(-a) = 0, a, -a å R   a) $\frac{5}{\sqrt{7}} + \frac{\sqrt{7}}{5} = 0$ b) $\frac{5}{\sqrt{7}} + (-\frac{5}{\sqrt{7}}) = 0$ c) $\frac{5}{\sqrt{7}} + \frac{5}{\sqrt{7}} = 0$ d) $\frac{5}{\sqrt{7}} + (-\frac{\sqrt{7}}{5}) = 0$

2. $a \times \frac{1}{a} = 1$, a å R D •   a) $\frac{1}{\sqrt{3}} \times \frac{1}{\sqrt{3}} = 1$ b) $\frac{1}{\sqrt{3}} \times \frac{-1}{\sqrt{3}} = 1$ c) $\frac{1}{\sqrt{3}} \times \sqrt{3} = 1$ d) $\frac{1}{\sqrt{3}} \times (-\sqrt{3}) = 1$

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3. $7\sqrt{5} - 8$ a) $7\sqrt{5} + 8$ b) $-7\sqrt{5} - 8$ c) $\frac{1}{7\sqrt{5} - 8}$ d) $-7\sqrt{5} + 8$

4. $-\sqrt{1} - \sqrt{2}$ a) $1 + \sqrt{2}$ b) $\sqrt{1} - \sqrt{2}$ c) $\sqrt{2} - \sqrt{1}$ d) $-1 - \sqrt{2}$

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5. $-\sqrt{\frac{1}{12}}$ a) $2\sqrt{3}$ b) $\frac{-1}{2\sqrt{3}}$ c) $-2\sqrt{3}$ d) $\frac{1}{2\sqrt{3}}$

6. $-6\frac{2}{5} - 3\frac{3}{5}$ a) $\frac{5}{14}$ b) $\frac{-5}{14}$ c) $\frac{1}{10}$ d) $\frac{-1}{10}$

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1. $7\sqrt{20} - 3\sqrt{45}$ a) $23\sqrt{5}$ b) $5\sqrt{5}$ c) $-23\sqrt{5}$ d) $-5\sqrt{5}$

2. $\sqrt[3]{-27}(\sqrt{7} + 1^3) + 7\sqrt{7}$ a) $4\sqrt{7} - 9$ b) $10\sqrt{7} - 3$ c) $10\sqrt{7} - 9$ d) $4\sqrt{7} - 3$

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3. $\frac{\sqrt{98} - \sqrt{18}}{3\sqrt{24}}$ a) $\frac{3}{2\sqrt{3}}$ b) $\frac{2}{3\sqrt{3}}$ c) $\frac{2}{3\sqrt{2}}$ d) $\frac{3}{2\sqrt{2}}$

4. $\frac{10\sqrt{6}}{\sqrt{48}} \div \frac{5\sqrt{2}}{\sqrt{49}}$ a) $\frac{2}{7}$ b) $-\frac{7}{2}$ c) $\frac{7}{2}$ d) $-\frac{2}{7}$

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1. 49 a) $\sqrt{7}$ b) ± 7 c) $\sqrt{7}$ d) -7
2. 225 a) $\sqrt{15}$ b) ± $\sqrt{15}$ c) ± 15 d) 15
3. 6.25 a) ± 2.5 b) ± 5.2 c) ± 2.25 d) ± 22.5

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4. 3 cm, 5 cm, ? a) $\sqrt{4}$ b) 4 c) $\sqrt{4}$ d) -4
5. 4 cm, $\sqrt{65}$ cm, ? a) $\sqrt{7}$ b) -7 c) $\sqrt{7}$ d) 7

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1.

X	4	-4	-4	4
Y	4	-4	4	-4

a) Þ ô Ä ˜ ´ ã b) š à œ ã

c) Ê ‘ ® ã d) Ñ ® ¤ è ã

2.

X	2	-4	-3	2
Y	3	3	0	0

a) Þ ô Ä ˜ ´ ã b) É ´ ü ã ¿ • í

c) Ê ‘ ® ã

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3. {(-4,0) (0,5)} a) 6.3 b) 6 c) 4. 6 d) 6.4
4. {(3,3) (-3,-3)} a) 8.4 b) 5.8 c) 8.5 d) 8
5. {(0,0) (6,-5)} a) 7 b) 6 c) 7. 8 d) 6.7

3-1

1. $(\sqrt{5}y^2x^2 + 6) + (3\sqrt{5}x^2y^2 + 9y + 4)$
   a) $4\sqrt{5}\,y^2x^2 + 10$
   b) $2\sqrt{5}\,y^3x^2 + 9y + 10$
   c) $4\sqrt{5}\,y^3x^2 + 10y$
   d) $4\sqrt{5}\,y^2x^2 + 9y + 10$

2. $(|-2|z^2w + 4k + \sqrt{7}) + (|10|z^2w - 10k + 2\sqrt{7})$
   a) $8z^2w + 6k + 3\sqrt{7}$
   b) $-12z^2w - 6k + 3\sqrt{7}$
   c) $12z^2w - 6k + 3\sqrt{7}$
   d) $-12z^2w - 14k + 3\sqrt{7}$

3. $(\sqrt{13}g^3h^4 + z^2 + 20) - (5\sqrt{13}g^3h^4 - 4z^2 + 12)$
   a) $4\sqrt{13}g^3h^4 + 5z^2 + 22$
   b) $4\sqrt{13}g^3h^4 + 3z^2 + 8$
   c) $-4\sqrt{13}g^3h^4 - 5z^2 + 20$
   d) $-4\sqrt{13}g^3h^4 + 5z^2 + 8$

4. $(|-24|yz + 2x^2 + 12) - (6yz - 15x^2 - 4)$
   a) $30yz + 13x^2 + 16$
   b) $-18yz - 13x^2 + 8$
   c) $18yz + 17x^2 + 16$
   d) $18yz - 13x^2 + 16$

3-2

1. $(-25x^2y^2z)(4xy)$ a) $-100x^3y^3$ b) $100x^3y^3z$ c) $100x^2y^2z$ d) $-100x^3y^3z$

2. $(\frac{7}{2}z^2w^2)(\frac{3}{9}zw^3)$ a) $\frac{21}{18}z^2w^6$ b) $-\frac{7}{6}z^3w^5$ c) $\frac{7}{6}z^3w^6$ d) $\frac{7}{6}z^2w^5$

3. $(\sqrt{5}h^2k^2)((\sqrt{5}h^2k^3)$ a) $5h^4k^5$ b) $5k^5$ c) $5k$ d) $5k^6$

4. $(|-3|g^3h)((|4|g^4h^2)$ a) $-12gh$ b) $-12g^7h^2$ c) $12g^7h^3$ d) $12g^7h$

5. $\frac{1}{2}m^2n^2(4mn + 8)$
   a) $4m^3n^3 + 16mn$
   b) $2m^3n^3 + 4$
   c) $4mn + 4m^2n^2$
   d) $4m^3n^3 + 4m^2n^2$

Multiple Choice

>3-3 @

1. $(x-5)(x+5)$ a) x^2+25 b) x^2-25 c) $x^2-10x+25$ d) $x^2+5x-25$
2. $(z-\sqrt{5})(z+\sqrt{5})$ a) z^2-5 b) z^2+5 c) $z^2+\sqrt{25}z+5$ d) $z^2-\sqrt{25}z-5$
3. $(|-4|gh-3)(|4|gh+3)$ a) $16g^2h^2+gh+9$ b) $16g^2h^2-gh+9$ c) $16g^2h^2+9$ d) $16g^2h^2-9$
4. $(\frac{1}{2}x-3)(\frac{1}{4}x^2+\frac{3}{2}x+9)$ a) $8x^3+27$ b) $\frac{1}{8}x^3+27$ c) $8x^3-27$ d) $\frac{1}{8}x^3-27$
5. $(2y-1)(4y^2+2y+1)$ a) $8y^3-1$ b) y^3-8 c) $8y^3+1$ d) y^3+8

>3-4 @

1. $\frac{36z^2w^2}{9zw}$ a) $4z^3w^3$ b) $\frac{1}{4}zw$ c) $4zw$ d) $\frac{1}{4}z^3w^3$
2. $\frac{81g^3h^3}{3g^{-6}h^{-6}}$ a) $27g^3h^3$ b) $27g^9h^9$ c) $27g^{-3}h^{-3}$ d) $27g^{-9}h^{-9}$
3. $\frac{\sqrt{49}x^{-2}y^2}{7x^{-3}y^{-2}}$ a) xy^4 b) $7x^{-6}y^4$ c) $x^{-6}y^4$ d) xy
4. $\frac{5x^2y^2-15x^4y^2+20x^5y^3}{5x^3y^3}$ a) $x^5y^5-3x^7y^6+4x^2$ b) $\frac{1}{xy}-3xy^{-1}+4x^2$ c) $y^5x^5-3xy^5+4x^2y^6$ d) $xy-3xy+4x^2y$
5. $\frac{16m^6n^6-32m^7n^6-4m^4n^4}{4m^3n^3}$ a) $4m^9n^9-8m^{10}n^9-m^7n^7$ b) $4m^2n^2-8m^4n^3-mn$ c) $4m^3n^3-8m^4n^3-m^7n^7$ d) $4m^3n^3-8m^4n^3-mn$

Multiple Choice

3-5

1. $81xy + 72x$ a) $9x(9y+8)$ b) $9(9xy-8)$ c) $9x(9xy-9)$ d) $9x(9xy+9)$

2. $7z^3 - z^2$ a) $7z^2(z + \frac{1}{7})$ b) $z^2(7z + 1)$ c) $7z^2(z - \frac{1}{7})$ d) $z^3(z - 1)$

3. $49g^2h^2 + 21gh$ a) $7gh(7gh+3)$ b) $7gh(7gh-3)$ c) $7(7gh+3)$ d) $h^2(7g^2+3gh+1)$

4. $11m^3n^2 - 44m^2n^2 - 121mn$
   a) $mn(11m^2n - 4mn-1)$ b) $11mn(m^2n-4mn-11)$
   c) $11mn(m^2n-4mn-11)$ d) $11(11m^2n^2-4mn-1)$

5. $150r^3v^2 + 25rv+75r^2v^2$ a) $25rv(6r^2v+1 +3rv)$ b) $25rv(6rv+3rv-1)$ c) $75 rv(2rv+1)$ d) $75r^2v(2+3+rv)$

4-1

1. $5x+ 20 = 4x -10$ a) $x = 10$ b) $x = 30$ c) $x = -10$ d) $x = -30$

2. $|-12|\, z = \sqrt[3]{8} +13z$ a) $z = 2$ b) $z = 4$ c) $z = -2$ d) $z = -4$

3. $\sqrt[3]{27}\, x+1= |-11|+2x$ a) $x = 12$ b) $x = -10$ c) $x =10$ d) $x = -12$

4. $\sqrt[3]{27}\, x \div |-5| = 8$ a) $x = \frac{40}{3}$ b) $x = \frac{3}{40}$ c) $x = -\frac{40}{3}$ d) $x = -\frac{3}{40}$

5. $|-6|\, h = 81\div (-3)$ a) $h = \frac{2}{9}$ b) $h = -\frac{9}{2}$ c) $h = -\frac{2}{9}$ d) $h = \frac{9}{2}$

1. $|-8| + x = 12 - 2x$ a) $x = -\frac{3}{4}$ b) $x = -\frac{4}{3}$ c) $x = \frac{4}{3}$ d) $x = \frac{3}{4}$

2. $\sqrt[3]{125}\, x \div |-5| = 2\sqrt{7} \div 7$ a) $x = -\frac{2}{\sqrt{7}}$ b) $x = \frac{2}{7}$ c) $x = \frac{2}{\sqrt{7}}$ d) $x = -\frac{2}{7}$

3. $\frac{6y}{2 + \sqrt[3]{-27}} = \frac{y}{3}$ a) $y = -\frac{1}{17}$ b) $y = 0$ c) $y = \frac{1}{17}$ d) $y = 17$

4. $|z - 12| = 7$ a) $s = \{-19, -5\}$ b) $s = \{-19, 5\}$ c) $s = \{19, -5\}$ d) $s = \{19, 5\}$

5. $|3y - 20| = \sqrt{36}$ a) $s = \{\frac{26}{3}, \frac{3}{14}\}$ b) $s = \{\frac{3}{26}, \frac{14}{3}\}$ c) $s = \{\frac{26}{-3}, \frac{14}{-3}\}$ d) $s = \{\frac{26}{3}, \frac{14}{3}\}$

6.

a) $|x + 4| = 5$ b) $|x - 4| = 5$ c) $|x + 3| = 5$ d) $|x - 3| = 5$

1. $9y^2 = 1$ a) $s = \{\frac{1}{3}, \frac{1}{-3}\}$ b) $s = \{\frac{1}{9}, \frac{1}{-9}\}$ c) $s = \{\frac{1}{-3}, \frac{1}{-9}\}$ d) $s = \{\frac{1}{3}, \frac{1}{9}\}$

2. $\frac{1}{3}t^2 = 12$ a) $s = \{6, 0\}$ b) $s = \{-6, 0\}$ c) $s = \{2, -2\}$ d) $s = \{6, -6\}$

3. $n^2 - \frac{2}{8} = \frac{3}{8}$

a) $s = \{\sqrt{\frac{8}{5}}, -\sqrt{\frac{8}{5}}\}$ b) $s = \{\sqrt{\frac{1}{8}}, -\sqrt{\frac{1}{8}}\}$ c) $s = \{\sqrt{\frac{5}{8}}, -\sqrt{\frac{5}{8}}\}$ d) $s = \{\sqrt{\frac{5}{8}}, -\sqrt{\frac{8}{5}}\}$

4. $x^2 - x = 0$ a) $s = \{0, -1\}$ b) $s = \{1, 1\}$ c) $s = \{1, -1\}$ d) $s = \{0, 1\}$

5. $\frac{1}{5}r - \frac{1}{\sqrt{5}}r^2 = 0$ a) $s = \{0, \frac{1}{5}\}$ b) $s = \{0, \frac{-1}{\sqrt{5}}\}$ c) $s = \{0, \frac{-1}{5}\}$ d) $s = \{0, \frac{1}{\sqrt{5}}\}$

R ò Ó æ ô 4-4 @ ± - ª ß

1. $3y-\sqrt[3]{8}$ • \ $\sqrt[3]{-27}$ D \ " E \ • F \ •

2. $4\left(\frac{1}{4}z+\frac{5}{14}\right)<0$ a) $z<\frac{10}{7}$ b) $z<\frac{10}{7}$ c) $z>\frac{10}{7}$ d) $z<\frac{10}{7}$

3. $\frac{4h}{6}$ • $\frac{8}{21}$ a) $s=\{h: h å 5\ K\frac{4}{7}\}$ b) $s=\{h: h å 5\ K\frac{4}{7}\}$ c) $s=\{h: h å 5\ K\frac{4}{7}\}$ d) $s=\{h: h å 5\ K\frac{4}{7}\}$

4. $\frac{1}{\sqrt{2}}$ " $\frac{\sqrt{2}n}{9}$ D $Q\frac{9}{2}$ " $\frac{9}{2}$ E Q • $\frac{-9}{2}$ F Q • $\frac{-9}{2}$ G Q "

5. $5y+\sqrt[3]{-27}>3y-\sqrt[3]{8}$ a) $y\ \frac{1}{2}$ b) $\frac{1}{2}$ \ " c) $\frac{1}{2}$ \ • d) $y>\frac{1}{2}$

6. $4\left(\frac{1}{7}-\frac{3}{12}\right)$] " $\frac{-4}{7}$ D] • $\frac{7}{4}$ E] " $\frac{4}{7}$] " d)] $\frac{4}{7}$

R ò Ó 4-5 @ ± - ª ß

1. \ • $\sqrt[3]{125}$ a) $s=\{y: y å 5\ \frac{5}{8}\}$ b) $s=\{y: y å 5\ \frac{8}{5}\}$ c) $s=\{y: y å 5\ \frac{5}{8}\}$ d) $s=\{y: y å 5\ \frac{8}{5}\}$

2. $\frac{1}{2}\left(x-\frac{4}{3}\right)+\frac{1}{6}x<-\frac{2}{3}$ a) $x<\frac{4}{3}$ b) $x>0$ c) $x<0$ d) $x>\frac{-4}{3}$

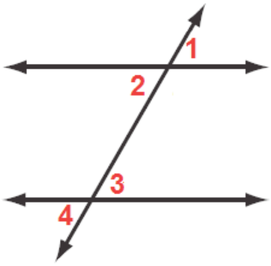
3. $2(v-4\sqrt{5})>5(v-\sqrt{5})$ a) $v<-\sqrt{5}$ b) $v>\sqrt{5}$ c) $v>-\sqrt{5}$ d) $v<\sqrt{5}$

4. $\frac{1}{5}(z-\sqrt{3})$ • $\frac{1}{5}(\sqrt{3}-z)$ D] $\sqrt{3}$ E $\frac{2}{\sqrt{3}}$] " F $\sqrt{3}$] " G $\frac{2}{\sqrt{3}}$] •

5. $\frac{12}{\sqrt[3]{-27}}-2r>\frac{1}{3}-r$ a) $r>\frac{13}{3}$ b) $r<\frac{13}{3}$ c) $r<\frac{3}{13}$ d) $r>\frac{3}{13}$

ò — „ ó Ž ä ã Þ Ü ß ” ¤ ô ¤ ¼

• Ž ó ® È @ ± •

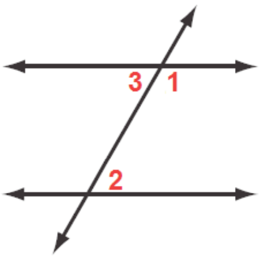


: - í Ž ä ß • Þ Ü ¸ ß æ ò Ó í • ° ß 1 æ ô ‘

a. å Ž — - í Ž ˜ ã b. å Ž ˜ ß © Ž ’ ˜ ã

c. ± å ® ß ä Ž Ø ˜ ã d. å Ž — ® Å Ž è ˜ ã

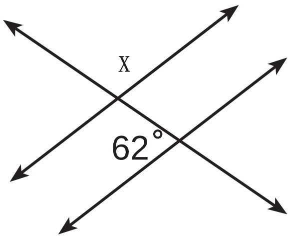
ñ í Ž ´ ó ∠ 2 å Ž Ó ∠1 60 ø å Ž Û • « • - 2 Ž ä ß



a. 60 ø b. 80 ø

c. 90 ø d. 120 ø

- í Ž ä ß • Þ Ü ¸ ß • ò 3 x ” ó

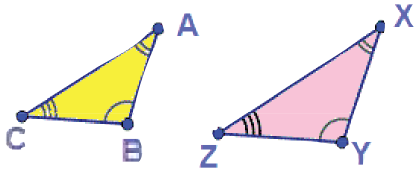


a.

c. 90 ø d.88 ø

• Ž œ à œ ä ß • Ö ‘ ± Ž Ä

- í Ž ä ß • Þ Ü ¸ ß 1 ò Ó



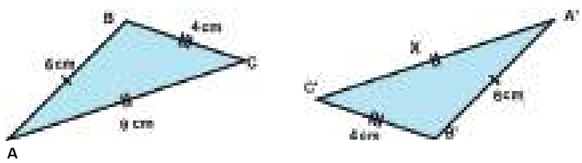
“ © ª ¤ ã ” ó í • Ö ‘ Ž • Å ´ — å Ž Ø ‘ Ž Ä ˜ ã

b. ” › Ž ü à è ß Ö ‘ Ž • Ä ´ — å Ž Ø ‘ Ž Ä ˜ ã

c. ” › Ž ü è ß Ö • ‘ Ž Ö ˜ Ž Ä • Ž œ å ô ä ß å Ž Ø ‘ Ž Ä ˜ ã

d. Ž © ª ¤ ã Ê à ¿ ó í • Ž • Ä ´ — å Ž Ø ‘ Ž Ä ˜ ã

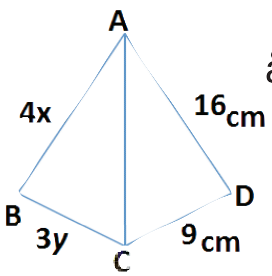
Ê à À ß • Ý î Ä Þ ä ê ä — å Ž Ó ß • ¬ ß å Ž Ø ‘ Ž Ä 2 - í Ž



a

c. 6 cm d. 2 cm

å Ž Ø ‘ Ž Ä ˜ ã - í Ž $ ä ß • ì Þ Ü ¸ ß • å Ž œ à X ¸ Y ä ß ” • 3 —

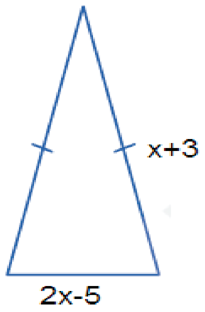


a. (x=

c. (x = 3 ,y = 3) d. (x = 4,y =3)

ò—„ó Žäã ÞÜß ”¤ô¤½

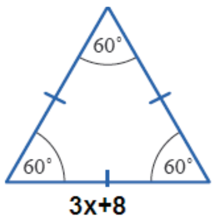
”óí•°ß• â‹Ž× ì Éü¿û• ñíŽ´˜ã ± æô >5Ž3´@ •±ñ ªì



1 X ”äô× åŽÓ 13cm Âô¤äß• å• –äàË •« -íŽ ä

a. 6 b. 5

c. 4 d. 3



2 : X ”äô× åŽÓ 69cm êÄô¤ã åŽÛ •«• - äß•

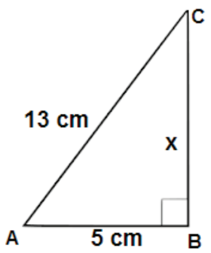
a. 6 b. 5

c. 4 d. 3

3 : æô×Ž´ß• ñíŽ´˜ãí ”óí•°ß• Ž× šà

a. 60Ø b. 30Ø

c. 45Ø d. 90Ø

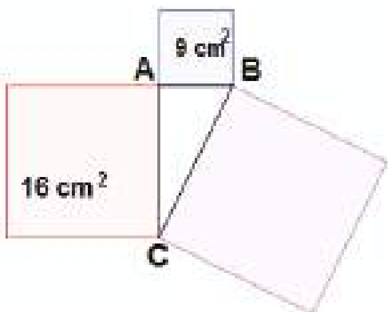


4 BC ÊàÀß• ÝîÁ -íŽ äß• ó í•°ß•

a. 12 b. 6 c.5 d. 9

5 ñíŽ´— ®ô’ÜßÂ ê’®äßí•°ßŽ´ã‹Ž× šè äß• -

a. 4 cm^2 b. 9 cm^2 c. 6 cm d. 25 cm^2



6 šàœäß ŽËü¿• –çŽÛ îß Žäôó ±-îÏŽó ó ”èè

a. { 3,4,5 } b. { 6,8,10 } c.{ 5,12,13 } d. { 3,5,33}

ò—„ó Žäã ÞÜß "¤ô

Ñ®¤èä-ß@ ê±'-î ß [5-4]

1. ñíŽó 16cm êËŽÔ—10cm ÝîÁíªËŽƒ× Ýã ÁË •«‡ Éü¿ ñ¯•î

a. 800 cm^2 b. 1600 cm^2 c. 900 cm^2 d. 160 cm^2

2. ñíŽó 4cm , 10cm "-íŽ ˜äß• êËü¿ƒ æã æôè› ÝîÁ

a. 40 cm b. 20 cm c. 28 cm d. 80 cm

3. : 5cm êËŽÔ—10cm , 6cm êôÓ æôó¯•î˜ã æôÌà¿ ûî ñ¬ß

a. 110 cm^2 b. 90 cm^2 c. 100 cm^2 d. 40 cm^2

4. êÌà¿ Ý10cm åŽÓ êËŽÔ—1500cm^2 íê˜£Ž´ã æôÌã

a. 75 cm b. 150 cm c. 36 cm d. 90 cm

5. ê˜£Ž´ã åŽÓ "ªËŽØ 16cm ÝîÁ—ÒªËçŽ× êËŽÔ Éüí¿

a. 144 cm^2 b. 128 cm^2 c. 80 cm^2 d. 40 cm^2

â ¤ß• ì "ô¤Ä´ß• ê£Ž´äß• ì ª-Ž @¨ß•ªß [5-5]

1. "ô'çŽ ß• Žìõ 10cm Ž´ã ËŽÔ 14cm -Žì—ªËŽ× ®Ä× Ò¼ç Ý "ä‹

a. 700 cm^2 b. 820 cm^2 c. 880 cm^2 d. 800 cm^2

2. "ôàÜß• Žìõ 3cm £Žîã ËŽÔ 7cm Ž•ì—ªËŽ× ®Ä× Ò¼ç ÝîÁ ðàÐã

a. 176π cm^2 b. 170π cm^2 c. 190π cm^2 d. 140π cm^2

3. ŽìËŽÔ—360π cm^3 åŽÓä 6cm Žì—ªËŽ× ®Ä× Ò¼ç Ý "ä‹

a. 16 cm b. 8 cm c. 10 cm d. 5 cm

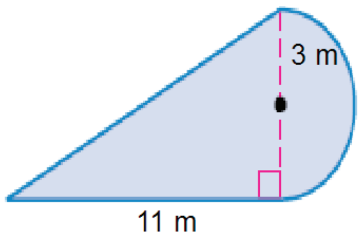
4. : Žìä £ 3cm åŽÓ ë®Ä× Ò¼ç "Ó

a. 36π cm^3 b. 18π cm^3 c. 24π cm^3 d. 72π cm^3

5. : 400π cm^2 "ô¤Ä´ß• Žì˜£Ž´ã "Û ®Ä

a. 12 cm b. 8 cm c. 10 cm d. 9 cm

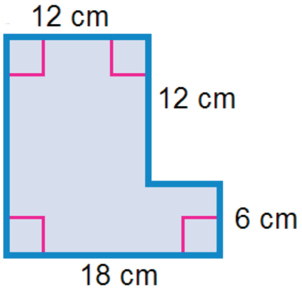
”äÈ˜èäß• ®ôÏí ”äÈ˜èäß• >5-6@ äß-ª



1 ñíŽ´— -íŽ äß• âÈ˜èäß •Û®ä

a. 47.13 cm² b. 18.13 cm²

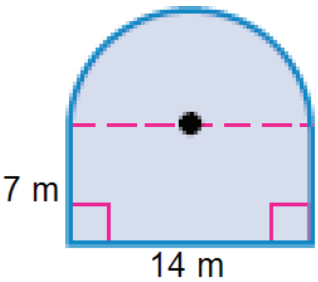
c. 74.13 cm² d. 90.13 cm²



2 ñíŽ´— -íŽ äß• âÈ˜èäß •Û®ä

a. 225 cm² b. 252 cm²

c. 522 cm² d. 512 cm²



3 ñíŽ´— -íŽ äß• âÈ˜èäß •Û®ä

a. 175 cm² b. 170 cm²

c. 180 cm² d. 215 cm²

4 -íŽ äß• ÞÜ¸ß• òÓ ¡Ž˜Ôä • ¢Ä´ß

a. 32 cm² b. 30 cm²

c. 31 cm² d. 33 cm²

5 Žë®Ä× Ò¼ç “®ªÄó®”§Ä Ž¤íŽ ä ß “-î¼ß
“-î¼‘ ©•ªÐ‘ ”èóªã ”£Žää- äíÛô Øä‘í
“®‹•ªß• ”£Ž´ã ••®¨

a. 12π cm² b. 8π cm²

c. 10π cm² d. 9π cm²

[illegible]

[illegible]

1 [illegible]

a. [illegible] b. [illegible] c. [illegible] d. [illegible]

2 [illegible]

10km [illegible]

a. 5 b. 10 c. 20 d. 30

3 [illegible]

	-1	x	-3
	1	2	3

a. 3 b. 4 c. -2 d.9

4 [illegible]

	-1	0	x
	2	3	4

a. 1 b. 1 c. 2 d. -2

[illegible]

1 [illegible]

D [illegible] E [illegible]

F [illegible] G [illegible]

2 [illegible]

D [illegible] E [illegible] F [illegible] G [illegible]

3 [illegible]

a.{-15,-1 ,13} b. {15,1 ,13} c. {15,-1,13} d. {15,-1,-13}

4 [illegible]

a.1-x b. -1-x c. x-1 d. 2-x

>6-3 @

1.

a. y=4x-1 b. $y=4x^2-1$ c. $y=\sqrt{4(x-1)}$ d. $y=\frac{4}{x-1}$

2.

a. y=2x-1 b. y=2x+1 c. y=12-x d. y=2x

3.

a. y=13-x b. y = 13+x c. y = -3x-1 d. y = -3x

4. 50

a. 2x - 4 = 50 b. 24- x = 50 c. 42-x = 50 d. 24+x = 50

>6-4 @

1. -2,3 -2,3

2.

a. (2,-4) b. (-2 ,4) c. (-2 ,-4) d. (2,4)

3.

a. (-1,-3) b. (-1,3) c. (1,-3) d. (1,3)

4. 90 -2,4

a. (-2,-4) b. (4,-2) c. (-4,2) d. (4,2)

5. 90 -1,3

a. (1,-3) b. (-3,-1) c. (1,0) d. (3,-1)

ò — „ó Žää ÞÜß ”¤ô

ò›•ª£÷• ñî˜´äß[6-5]ò@ ±Žª¤ß

••³£æôäôß• î¤ç 2,5 **1**

a. (0,5) b. (5,5) c.(5,0) d.(2,8)

“ª£•í “ª£í ðàËû• î¤ç **2**

a. (3,7) b.(3,5) c.(4,7) d.(4,6)

ðàËû• î¤ç “ª£•í “ª£íí 3æ3ôäôÆØèß **3**

a.(2,5) b.(-5,-2) c. (5,-2) d.(-5,2)

:C -•ªØã ŽäÓ $ “ % “ –þABÇÓ š$àœä **4**

a.(5,2) b. (2,5) c.(6,2) d.(2,6)

: ÞÔ³û• ðß• “ª£íxm4 •ŽÄØçèûŽ• **5**

a.(x-m,y) b.(x+m,y) c.(x,4+m) d. (x,4-m)

ïªäß•í ”ó°Û®äß[7-”Ë@° èßª ß

1

0	4 5 6 7 7 8
1	0 2

a. 4 ,5 ,6, 7, 8, 10,12 b. 4 ,5 ,6, 8,12 c. 4 ,5 ,6, 7,7,10,12 d. 4,5 ,6 ,7 ,7, 8, 10,1

éŽç©ƒ Ýíª ß• òÓ •ŽçŽô’ß• Þœä **2**

A	3	11	21	33	17
B	10	9	30	11	3

a.

الورقة B	الساق	الورقة A
3 9	0	3
10	1	17
	2	1
0	3	3

b.

الورقة B	الساق	الورقة A
3	0	3
1 0	1	7
0	2	1
0	3	3

c.

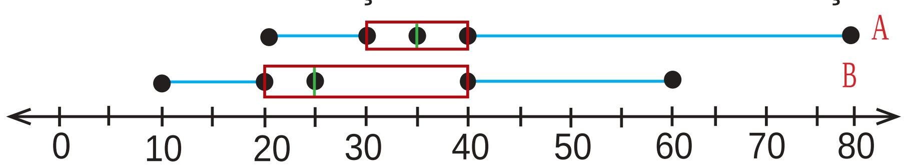
الورقة B	الساق	الورقة A
3 0	0	3
1 0	1	1 7
0	2	1
0	3	3

الورقة B	الساق	الورقة A
9	0	3
1	1	7
0	2	1
0	3	3

1

a.　　　b.　　　c.　　　d.

2



a. A=20,B=10　　b. A=40,B=10　　c. A=20,B=30　　d. A=10,B=20

3

أرتفاع النباتات		
80	42	55
72	68	78
65	40	52

a. 40,50　　b. 55,51　　c. 47,75　　d. 41,79

1

a. 8　　b. 4　　c. 3　　d. 12

2

القطعة الأولى	H	H	T	T
القطعة الثانية	H	T	H	T

a. {(H,T)}　　b. {(T,H)}　　c. {(H,T),(T,H)}　　d. {(H,T),(T,T)}

3

a. 6　　b. 12　　c. 24　　d. 36

1

2

•ûŽä˜£ûä 7-5 @ ±-

1 ï®§û• ªÌ' Žäëª£• åŽóõŽÀô•®¾Ž5 ®Û®ä 7¤³ •ï®ûÓ4 ªè»
î ë ”ôçŽœß• ïŽÀô'ß• “®Üß•

a. $\frac{1}{15}$ b. $\frac{7}{16}$ c. $\frac{6}{15}$ d. $\frac{2}{15}$

2 å„Ó æôãŽ˜E_2 E_1 ãåŽŽ•£•

a. $P(E_1) \times P(E_2) = 1$ b. $P(E_1) - P(E_2) = 1$

c. $P(E_1) + P(E_2) = 1$ d. $P(E_1) - P(E_2) = 0$

3 •Ž×ŽÄ'ß• æã òŸí¯ ®ôÏ Žìä×- ”×ŽÄ' ò‹•î¸Ë ÞÜ¸' •¤
î ë 1 ì 3 ì 5 ì7 ”

a. 75% b. 50% c. 25% d. 100%

ñ®Èèß• ÝŽä˜£û•í ä 7-6 @ ˜ß-•ª

Ãã¾„¶}$ í³„}	
H , H	2
H , T	3
T , H	4
T , T	1

1 ©îØç ò˜ÌÄ× òã- ž‹Žç æô
î ë ”'Ž˜Ûí “-î» ðàË Ýî¼¤àß 10 ñ®È

a. $\frac{3}{10}$ b. $\frac{7}{10}$ c. $\frac{1}{2}$ d. $\frac{1}{3}$

2 î ë ”'Ž˜Ûí “-î» ðàË Ýî¼¤àß ò'ó® ˜ß• ÝŽä˜£• ì 1

a. $\frac{3}{10}$ b. $\frac{7}{10}$ c. $\frac{1}{3}$ d. $\frac{1}{6}$

3 ðàË ®·†äß• ò—„ó ®À ßÝŽäå£àßì“®ž 50 í×ì“®ž 200 ã Ö
î ë ”ôßŽ˜ß• “®äß• ò

a. 0.23 b. 0.24 c. 0.25 d. 0.30

4 ÝŽä˜£û •®×û• òë ”óîŒä»”•'´æçãñƒ¤ïŸßçŽ¤ª×26®àÛ 21û Þ
”ôßŽ˜ß• ”ßíŽ¤äß• òÓ ”¤ŸŽç

a. 50% b. 60% c. 70% d. 80%

Content المحتويات

&RQWHQW

Content &RQWHQW المحتويات